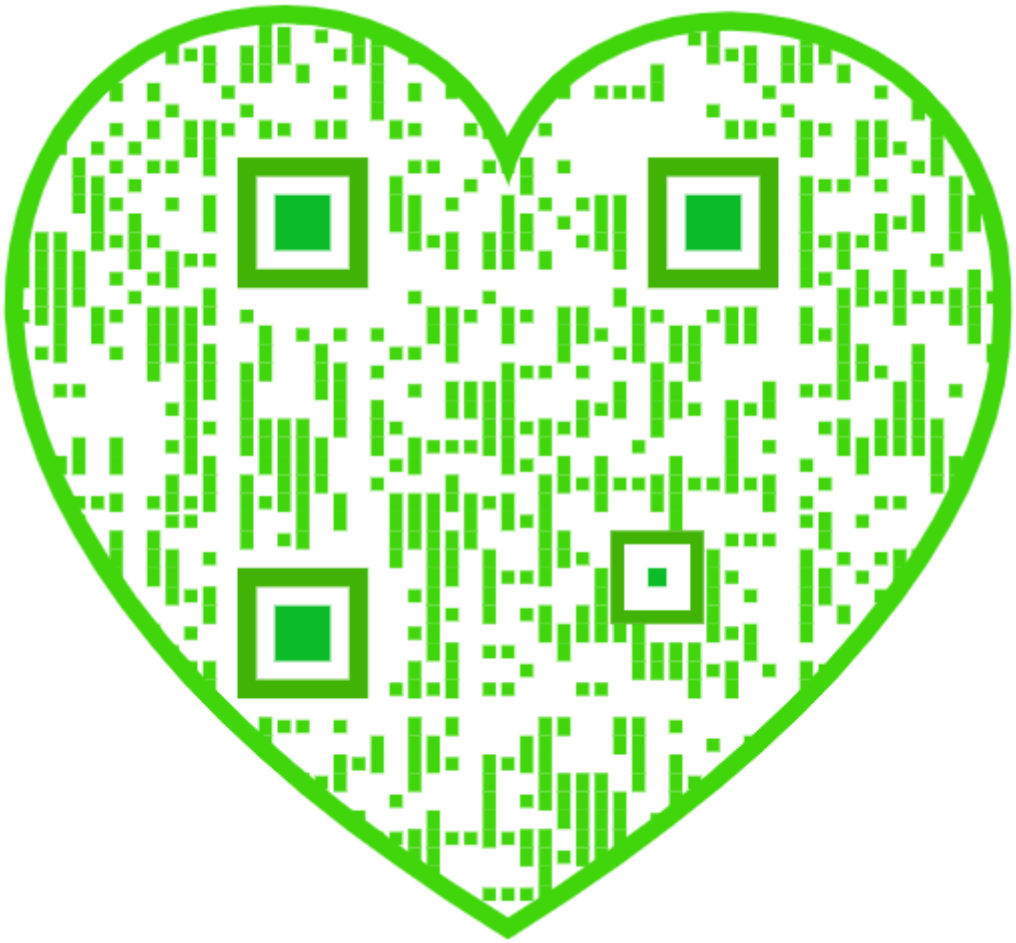

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THE ARCHITECT AND ENGINEER OF CALIFORNIA

PACIFIC COAST STATES

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MAY, 1912

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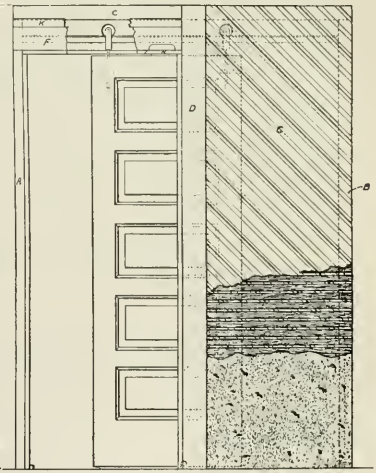

Fig 4

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N. Clark & Sons.....112 Natoma St., S. F.

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Risdon Water Tube Boiler, manufactured by Union Iron Works.....San Francisco

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Boyd & Moore.....356 Market St., S. F.
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Strable Mfg. Co.....Oakland, Cal.
The Building Material Co., "Medusa White Portland".....587 Monadnock Bldg., S. F.

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Petrifax Cement Coating, sold in San Francisco by Sherman Kimball, 503 Market St.
"Kahn System," Trussed Concrete Company, Rialto Bldg., S. F.

CEMENT EXTERIOR FINISH
The American Bitumastic Enamels Company, Hill, Hubbell & Co., Pacific Coast Agents, Flie Bldg., S. F.
Bay State Brick and Cement Coating, made by Wadsworth, Nowland & Co. [See list of distributing agents on page 123.]
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"Pabco" Damp Proofing Compound, sold by Paraffine Paint Co.....38 First St., S. F.
Parrott & Co., agents for Genasco Positive Seal Damp Proof Paint.
"Protectorine," Compound, sold by Boyd & Moore.....356 Market St., S. F.

DOORS—FREIGHT ELEVATOR
"Cross" Counterbalance Automatic, Boyd & Moore, Agents.....356 Market St., S. F.

DOOR HANGERS
Pitcher Hanger, sold by Pacific Tank Company.....231 Berry St., S. F.
Reliance Hanger, sold by Sartorius Co., S. F.; D. F. Fryer & Co., Louis R. Bedell, Los Angeles, and Portland Wire & Iron Works.

DOOR OPENER
G. Rischmuller,
Builders' Ex., and 3442 19th St., S. F.

DOORS—SCREEN
Higgin Mfg. Co., represented by Mailler Searles.....817 Monadnock Bldg., S. F.

DOORS—WAREHOUSE
"Cross" Horizontal Folding Doors, Boyd & Moore, Agents .....356 Market St., S. F.

DUMB WAITERS
Energy Dumb Waiters, Boyd & Moore, Agents.....356 Market St., S. F.
Wells & Spencer Machine Company,
173 Beale St., S. F.

ELECTRICAL CONTRACTORS
Butte Engineering Co..683 Howard St., S. F.
Central Electric Co..185 Stevenson St., S. F.
Electric Appliance Co., 726 Mission St., S. F.
Jno. G. Sutton Co.....229 Minna St., S. F.
Pacific Fire Extinguisher Company,

ELEVATORS 507 Montgomery St., S. F.
Otis Elevator Company,
Stockton and North Point, S. F.
Van Emon Elevator Co..54 Natoma St., S. F.
Wells & Spencer Machine Co.,

ELEVATOR CARS 507 Montgomery St., S. F.
Cleveland Art Metal Co., Boyd & Moore, Agents .....356 Market St., S. F.

ELEVATOR DOORS
"Cross" Elevator Doors, Boyd & Moore, Inc., Agents.....356 Market St., S. F.

ELEVATORS, SIGNALS, FLASHLIGHTS AND DIAL INDICATORS
Elevator Supply & Repair Co.,
593 Market St., S. F.

ENGINEERS
F. J. Amweg.....700 Marston Bldg., S. F.
W. W. Breite.....Clunie Bldg., S. F.

EXPRESS CALL SYSTEM
Elevator Supply & Repair Co.,
593 Market St., S. F.

FIRE ESCAPES
Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, etc. Phone Market 1374; Home, J 3435..370-84 Tenth St., S. F.

FIRE EXTINGUISHERS
Goodyear Rubber Company,
587-591 Market St., S. F.
Pacific Fire Extinguisher Co.,
507 Montgomery St., S. F.
Marshall & Schimpf.....Clunie Bldg., S. F.

FIREPLACE DAMPER
Head, Throat and Damper for open fireplaces, Colonial Fireplace Co., Chicago.
(See advertisement for Coast agencies.)
Jenkins Bros.,
30 Fremont St., S. F.
Capitol Sheet Metal Works (Inc).
1927-1935 Market St., S. F.
A. J. Forbes & Son...1530 Filbert St., S. F.
Co-Ran Fresh Air Bed,
833 Market St., S. F.
1764 Broadway, Oakland.

FIREPROOFING
Gladding, McBean & Company,
Crocker Bldg., S. F.
Roehling Construction Co., Crocker Bldg., S. F.

FIRE PROTECTION
Goodyear Rubber Company,
587-589 Market St., S. F.

FIRE PROTECTION—SPRINKLER SYSTEM
Jno. G. Sutton Co.....229 Mission St., S. F.
Pacific Fire Extinguisher Company, 507 Montgomery St., San Francisco; Branch Offices, Portland, Seattle and Spokane.

FIXTURES—BANK, OFFICE, STORE, ETC.
Burlingame Cabinet Works,
509-511 Sixth Street, San Francisco
T. H. Meek Company..1157 Mission St., S. F.
C. F. Weber & Co., 365 Market St., San Francisco and 210 N. Main St., Los Angeles, Cal.
Weary & Alford Co.,
303 Union Trust Bldg., S. F.
Fink & Schindler.....218 13th St., S. F.

FLOORS—COMPOSITION AND TILE
"Kompolite".....350 Mills Bldg., S. F.

FOUNDATION CONTRACTORS
Locke Foundation Company,
1107 Crocker Bldg., S. F.

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17TH & MISSOURI STS., SAN FRANCISCO

ARCHITECTS' SPECIFICATION INDEX—*Continued*

FLOOR VARNISH
Bass-Heuter and S. F. Pioneer Varnish Works, 816 Mission St., S. F.
R. W. Nason & Co....151 Potrero Ave., S. F.
Standard Varnish Works, Chicago, New York and S. F.
Worden-Meeker Varnish Works, S. F. and Oakland

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit.
Bowser & Co.....612 Howard St., S. F.

GAS GRATES AND LOGS
Backus Patent Gas Grates and Logs, Boyd & Moore, Inc., Agents, 356 Market St., S. F.

GLASS AND GLAZING
California Plate and Window Glass Company, 864 Mission St., San Francisco.
W. P. Fuller & Co., San Francisco, Los Angeles and Portland

GLASS—PRISM, ART, ETC.
California Art Glass Works, 768 Mission St., S. F.

GRAVEL, SAND AND CRUSHED ROCK
Bay Development Co....153 Berry St., S. F.
California Bldg., Material Co., Pacific Bldg., S. F.
Del Monte White Sand, sold by Pacific Improvement Co.....Crocker Bldg., S. F.
Grant Gravel Co.....87 Third St., S. F.
J. P. Holland.....Army St. Wharf, S. F. Phone Mission 5466.
Natomas Consolidated, Peoples' Savings Bank Bldg., Sacramento

HARD WALL PLASTER
Empire Hard Wall Plaster, sold by Pacific-Portland Cement Co., Pacific Bldg., S. F.
Reno Hard Wall Plaster, sold by Western Building Material Co., 430 California St., S. F.

HARDWOOD FLOORING
Boyd & Moore.....356 Market St., S. F.
Dieckmann Hardwood Co., 244 California St., S. F.
Strahle Mfg. Co. .....Oakland, Cal.
Parrott & Co.....320 California St., S. F.
White Bros., Cor. Fifth and Brannan Sts., S. F.

HARDWOOD LUMBER
Dieckmann Hardwood Co., Welcb Bldg., S. F.
Niehaus & Co.....548 Brannan St., S. F.
Parrott & Co.....320 California St., S. F.
Strahle Mfg. Co., First St., betw. Washington & Clay, Oakland
White Bros., Cor. Fifth and Brannao Sts., S. F.

HARDWOOD VENEER PANELS AND DOORS
E. A. Howard & Co.....Howard St., S. F.

HEATERS—AUTOMATIC
Hoffman Heater, sold by Holbrook, Merrill & Stetson, San Francisco and Los Angeles.
Humphrey Co., 565 N. Rose St., Kalamazoo, Mich.
Pittsburg Water Heater, sold by Thos. Thieben & Co.....585 Mission St., S. F.

HEATING EQUIPMENT—VACUUM, ETC.
C. A. Dunham Co., Marshalltown, Iowa, Western Division Office, Monadnock Bldg., S. F.
Marshall & Schimpf.....Clunie Bldg., S. F.

HEATING AND VENTILATING
Atlas Heating & Ventilating Co., Fourth and Freelon Sts, San Francisco
Gilley-Schmid Co., Inc., Thirteenth and Mission Sts., S. F.
Hoffman & Meuser, 1129-1131 Howard St., San Francisco

HEATING AND VENTILATING—Continued
Jno. G. Sutton Co.....243 Minna St., S. F.
Mangrum & Otter, Inc., 507 Mission St., S. F.
Pacific Blower & Heating Co., 17th St., betw. Mission and Valencia, S. F.
Pacific Fire Extinguisher Company, 507 Montgomery St., S. F.
Petersen-James Co.,....710 Larkin St., S. F.

HINGES
Stanley's Ball-Bearing Hinges, Stanley Co., New Britain, Conn.,

ICE MAKING MACHINES
"The Wizard," sold by the De Laval Dairy Supply Co., Drumm and Sacramento streets, San Francisco.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 418 Montgomery St., S. F.
Smith, Emery & Co., Inc., 651 Howard St., S. F.
R. E. Noble & Co., Humboldt Bank Bldg., S. F.

INSURANCE
David Duncan .....340 Sansome St., S. F.

INTERIOR DECORATING
L. Tozer & Son Co., 228 Grant Ave., S. F.

JOIST HANGERS
Western Builders' Supply Co., 680 Mission St., S. F.

KITCHEN EQUIPMENT
John G. Ils & Co.....827 Mission St., S. F.

LIME
Holmes Lime Company, Mutual Savings Bank Bldg., S. F.

LIGHTING FIXTURES
Adams & Hollopeter....745 Mission St., S. F.

LOCKERS—METAL
Hart & Cooley Co., Boyd & Moore, Agents, 356 Market St., S. F.

LUMBER
Sunset Lumber Co. .....Oakland, Cal.
Santa Fe Lumber Co., Seventeenth and De Haro Sts., S. F.

MANTELS
Mangrum & Otter.....561 Mission St., S. F.
S. Ginsberg & Co.....1029 Larkin St., S. F.
Watson Mantel & Tile Co., 457 Market St., S. F.

MARBLE
Columbia Marble Co....268 Market St., S. F.

METAL AND STEEL LATH
Roebling Construction Co., Crocker Bldg., S. F.

METAL CEILINGS
Berger Mnfg. Co.,....1120 Mission St., S. F.
San Francisco Metal Stamping & Corrugating Co.....Treat Ave. and 19th St., S. F.

METAL DOORS AND WINDOWS
Capitol Sheet Metal Works, 1927 Market St., S. F.
Dahlstrom Metallic Door Co., Western office, Rialto Bldg., S. F.
Metal Window Screens, Mailler Searles, Agt., ...817 Monadnock Bldg., S. F.
Rulofson Metal Window Works, Eighth and Brannan Sts., San Francisco
Waterhouse & Price.....59 Third St., S. F.
Zahner's Monarch Hollow Metal Doors and Trim, Boyd & Moore, Inc., Agents, 356 Market St., S. F.

METAL SHINGLES
Meurer Bros., J. A. McDonald, Pacific Coast Agent.....Third, near Townsend St., S. F.
San Francisco Metal Stamping & Corrugating Co.....Treat Ave. and 19th St., S. F.

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TELEPHONES: KEARNY 664 HOME J 1124

ARCHITECTS' SPECIFICATION INDEX—*Continued*

OFFICE FIXTURES
Fink & Schindler.....218 13th St., S. F.
Wm. Bateman.....1915 Bryant St., S. F.

OPERA CHAIRS
C. F. Weber & Co.....365 Market St., S. F.
Whitaker & Ray-Wiggin Co., San Francisco and Los Angeles.

ORNAMENTAL IRON AND BRONZE
J. G. Braun.....Chicago and New York
California Artistic Metal and Wire Company, San Francisco
Standard Company, represented by Mailler Searles,.....817 Monadnock Bldg., S. F.
Standard Iron Works, 235-39 Shipley St., S. F.
Golden Gate Structural & Ornamental Iron Works.....1479 Mission St., S. F.
C. J. Hillard Company Inc. 211-215 8th St. S. F.
West Coast Wire & Iron Works, 861-863 Howard St., S. F.

PAINT FOR STEEL STRUCTURES
The American Bitumastic Enamels Company, Hill, Hubbell & Co., Pacific Coast Agents, Fife Bldg., S. F.
Detroit Superior Graphite Paint, manufactured by Detroit Graphite Company. C. W. Pike Company, Coast Sales Agents, 22 Battery St., S. F.
Glidden's Acid Proof Coating, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.

PAINT FOR CEMENT
WESCO—West Coast Kalsomine Co., 110 Hansford Bldg., S. F.
The American Bitumastic Enamels Company, Hill, Hubbell & Co., Pacific Coast Agents, Fife Bldg., S. F.
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.). [See adv. in this issue for Pacific Coast agents.]
Dexter Bros., Sherman Kimball, Agent, 503 Market St., S. F.
Glidden's Liquid Cement, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Vitrolite Cold Water Paint, sold by Boyd & Moore.....356 Market St., S. F.
Worden-Meeker Varnish Co., S. F. & Oakland

PAINTS, OILS, ETC.
WESCO—West Coast Kalsomine Co., 110 Hansford Bldg., S. F.
Bass-Hueter Paint Company, Mission, near Fourth St., S. F.
"Bituline," sold by Bituline Co. of America, ...24 California St., S. F.
Glidden Varnish Co., Cleveland, Ohio, represented by Whittier-Coburn Co., S. F. and Los Angeles
Paraffine Paint Co.....38-40 First St., S. F.
R. N. Nason Company.....San Francisco

PAINTS, OILS, ETC.—Continued
Standard Varnish Works, represented by W. P. Fuller & Co., S. F. and Los Angeles
Worden-Meeker Varnish Co., S. F. & Oakland

PHOTOGRAPHY
Gabriel Moulin.....153 Kearny St., S. F.
Walter C. Scott.....558 Market St., S. F.

PIPE—CORRUGATED INGOT IRON
California Corrugated Culvert Company, Los Angeles and West Berkeley.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA.
N. Clark & Sons, 112 Natoma St., San Francisco
Pacific Sewer Pipe Company, I. W. Hellman Bldg., Los Angeles
Gladding, McBean & Co., Crocker Bldg., S. F.
Steiger Terra Cotta and Pottery Works, Mills Bldg, S. F.

PLASTERING CONTRACTORS
D. Ross Clarke.....708 Pacific Bldg., S. F.
Smyth Bros.....Monadnock Bldg., S. F.

PLUMBING
J. E. O'Mara.....447 Minna St., S. F.
Jno. G. Sutton Co.....229 Minna St., S. F.
Peterson-James Co.....710 Larkin St., S. F.
The J. Looney Company, 85 City Hall Ave., San Francisco
Wetzel & Grass, 105 Fulton St., S. F.

PLUMBING FIXTURES
Crane Co....Second and Brannan Sts., S. F.
Haines, Jones & Cadbury Co., 851-859 Folsom St., S. F.
Jno. Douglas Co.....571 Mission St., S. F.
Mark-Lally Co....First and Folsom Sts., S. F.
J. L. Mott Iron Works, D. H. Gulick, selling agent .....135 Kearny St., S. F.
N. O. Nelson Mfg. Co., 978 Howard St., S. F. 406 E. 4th St., Los Angeles
Geo. H. Tay Company, 617 Mission St., S. F.
F. F. Howard Co., Second and Folsom Sts., S. F.

PLUMBING MATERIALS
Mark-Lally Company, First and Folsom Sts., S. F.

PLUMBING SUPPLIES
California Steam & Plumbing Supply Co., Fifth and Bluxome Sts., S. F.

POTTERY
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.

PULLEYS, SHAFTING, GEARS, ETC.
Meese and Gottfried Company.. .....San Francisco, Seattle, Portland, Los Angeles

PUTTY
F. F. Virgin Co....718 Brannan St., S. F.

ROAD MACHINERY
Iroquois Iron Works (Barber Asphalt Company) .....Head Bldg., S. F.

RAILROADS
Southern Pacific Co.....Flood Bldg., S. F.
Western Pacific Railroad...Mills Bldg., S. F.

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209 E. SEVENTH STREET, Los Angeles

School Desks

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
C. F. Weber & Co.....365 Market St., S. F.
Lilley & Thurston Co....Rialto Bldg., S. F.

ROOFING AND ROOFING MATERIALS
J-M Asbestos Roofing, sold by H. W. Johns-Manville Co., Agencies in all the principal West Coast cities.
Pluvinox Roofing, sold by Boyd & Moore, Inc.....356 Market St., S. F.

ROOFING TIN
"Scott's Extra Coated," manufactured by Follansbee Bros. Co.....Pittsburg, Pa.
Meurer Bros. Co., A. H. McDonald, Coast Representative.....628 Third St., S. F.

ROOFING AND ROOFING MATERIALS
"Ferroinclave," the Brown Hoisting Machinery Co., Coast Agent, Chas. A. Levy, Balboa Bldg., S. F.
Fibrestone & Roofing Co., Mutual Savings Bank Bldg, S. F.
F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co., 82 Second St., S. F.
Genasco Ready Roofing, sold by Parrott & Co.....320 California St., S. F.
H. D. Samuel Company, 1054 Monadnock Bldg., S. F.
Mackenzie Roof Co., 425 15th St., Oakland
Meurer Bros. Co., A. H. McDonald, Coast Representative.....628 Third St., S. F.
Western Builders' Supply Co., 680 Mission St., S. F.

RUBBER TILING AND MATTING
Goodyear Rubber Co...587 Market St., S. F.
New York Belting & Packing Co., 129 First Street, S. F.

SAFES
Howe Scale Company, 333 Market St., S. F.

SAND
Del Monte White Sand, sold by Pacific Improvement Company, Crocker Bldg., S. F.
J. P. Holland.....Army St. Wharf, S. F.

SASH CORD
Puritan Sash Cord Company. (For Coast Agents, see advertisement on page 30.)
Samson Cordage Works, Manufacturers of Solid Braided Cords and Cotton Twines, 88 Broad St., Boston, Mass.
Silver Lake A Sash Cord, represented by Sanford Plummer, 149 New Montgomery St., S. F.

SCAGLIOLA
California Scaglola Co., F. Mayer, 68-70 Clara St., S. F.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Company, 1638 Long Beach Ave, Los Angeles

SCHOOL FURNITURE AND SUPPLIES
C. F. Weber & Co....365 Market St., S. F.
210 N. Main St., Los Angeles
Whitaker & Ray-Wiggin Co., 776 Mission St., S. F.; 209 E. Seventh St., Los Angeles.

SCREENS—WINDOW AND DOOR
Higgin Mfg. Co., represented by Mailler Searles.....817 Monadnock Bldg., S. F.
Invisible Roll Screen Company, Mailler Searles, Agt....817 Monadnock Bldg., S. F.

SHEATHING AND SOUND DEADENING
Neponset Waterproof Building Papers, Neponset Florian Sound Deadening Felt, manufactured by F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co.....Rialto Bldg., S. F.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles Portland, Tacoma and Spokane.

SHEET METAL WORK
Berger Mfg. Co.....1120 Mission St., S. F
Dunlevy & Gettle....79 City Hall Ave., S. F
Hibernia Sheet Metal Works, 219 Seventh St., S. F.

SHEET COPPER
C. G. Hussey & Co.....565-Folsom St., S. F.

SHINGLE STAINS
Cabot's Creosote Stains, sold by Waterbouse & Price, San Francisco, Los Angeles and Portland.
Dexter Bros. Company, represented by Sherman Kimball, Hooker & Lent Bldg., S. F.
W-M Shingle Stain, Worden-Meeker Varnish Co.....S. F. and Oakland

SKYLIGHT, CORNICES, ETC.
Hibernia Sheet Metal Works, 219 Seventh St., S. F.

STEAM FITTERS
Peterson & James.....710 Larkin St., S. F.

STEEL AND IRON—STRUCTURAL
Boyd & Moore.....356 Market St., S. F.
Central Iron Works...621 Florida St., S. F.
Judson Manufacturing Company, 819 Folsom Street, San Francisco
Mortenson Construction Co., 19th and Indiana Sts., S. F.
Pacific Rolling Mills, 17th and Mississippi Sts., S. F.
Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, etc. Phone Market 1374; Home, J 3435..370-84 Tenth St., S. F.
Union Iron Works.....San Francisco
U. S. Steel Products Company, Rialto Bldg., S. F.
Western Iron Works....125 Beale St., S. F.
Woods & Huddart.....356 Market St., S. F.

STEEL BARS FOR CONCRETE REINFORCEMENT
Baker & Hamilton, 4th and Brannan Sts., S. F.
Judson Manufacturing Company, 819 Folsom Street, San Francisco
Woods & Huddart.....356 Market St., S. F.

STEEL MOULDINGS FOR STORE FRONTS
J. G. Braun, 537 W. 35th St., N. Y., and 615 S. Paulina St., Chicago.

STORE FIXTURES
Fink & Schindler.....218 13th St., S. F.
Wm. Bateman.....1915 Bryant St., S. F.

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ARCHITECTS' SPECIFICATION INDEX—*Continued*

STORE FRONTS
Kawneer System, Kawneer Manufacturing Company, 654 Monadnock Bldg., S. F.; branches in Portland, Spokane, Seattle and Los Angeles.
Thorne Hold-Fast Metal Store Front Construction, Boyd & Moore, Inc., Agents.

TERRA COTTA CHIMNEY PIPE
Dunlevy & Gettle....79 City Hall Ave., S. F.
Gladding-McBean Co....Crocker Bldg., S. F.

TILES, MOSAICS, MANTELS, ETC.
Mangrum & Otter....561 Mission St., S. F.

TILE FOR ROOFING
Gladding, McBean & Company,
Crocker Bldg., S. F.

TILE—WALL AND ENAMEL
Watson Mantel and Tile Co.,
457 Market St., S. F.
S. Ginsberg & Co.....1029 Larkin St., S. F.

TILING
Thos F. Rigney.....9 City Hall Ave., S. F.

TIN PLATES
Meurer Bros. Co., A. H. McDonald, Coast Representative.....628 Third St., S. F.

VACUUM HEATING
Van Auken System of Vacuum Heating,
15 Fremont St., S. F.

VALVE PACKING
"Palmetto Twist," sold by H. N. Cook Belting Co.....317 Howard St., S. F.

VACUUM CLEANERS
McCrum-Howell Co., New York and Chicago. Branches in all principal cities.
Marshall & Schimpf.....Clunie Bldg., S. F.
Prentiss High Power Stationary Vacuum Cleaners,.....416 Market St., S. F.
Sanitary Vacuum Supply Company, 1601-3 Broadway, and 1600-2 Telegraph Ave., Oakland, Cal.
The Invincible Vacuum Cleaners, R. W. Foyle, California Agent,
149 New Montgomery St., S. F.
Vacuna Sales Company, Mailler Searles, Agent.....817 Monadnock Bldg., S. F.

VENETIAN BLINDS, AWNINGS, ETC.
C. F. Weber & Co....365 Market St., S. F.
Ericsson Swedish Venetian Blinds, Boyd & Moore, Inc., Agents..356 Market St., S. F.

VENEERS
Dieckmann Hardwood Co.,
Welch Bldg., 244 California St., S. F.
White Bros., Cor. Fifth and Brannan Sts., S. F.

VENTILATORS AND SHEET IRON
Meurer Bros. Co., A. H. McDonald, Coast Representative.....628 Third St., S. F.

WAINSCOTING
"Kompolite".....350 Mills Bldg., S. F.

WALL BEDS
Murphy Bed Company.....Lick Bldg., S. F.
Marshall & Stearns Co.,
1154 Phelan Bldg., S. F.

WALL BEDS—Continued
Pacific Spring Bed Company,
West Berkeley, Cal.
The Turner Wall Bed, sold by California Plate and Window Glass Co., San Francisco and Los Angeles. Mission near 5th, S. F.

WATERPROOF FINISHES
Dexter Bros., Sherman Kimball, Agent,
503 Market St., S. F.
Glidden's French Caen Stone Finish and Glidden's Waterproof Flat Finish, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.

WATERPROOFING FOR CONCRETE, ETC.
The American Bitumastic Enamel Company, Hill, Hubbell & Co., Pacific Coast Agents,
Fife Bldg., S. S.
"Ceresit," manufactured by the Ceresit Waterproofing Co., sold by Parrott & Co., San Francisco, Los Angeles and Portland, and Julien A. Becker Co., Seattle, Wash.
Dexter Bros., Sherman Kimball, Agent,
503 Market St., S. F.
Glidden's Concrete Floor Dressing and Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Neponset Waterdyke Felt and Compound, manufactured by F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co.....Rialto Bldg., S. F.
Parrott & Co.....320 California St., S. F.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
The Building Material Co., Inc.,
587 Monadnock Bldg., S. F.

WEATHER STRIPS
Higgin Mfg. Co., represented by Mailler Searles.....817 Monadnock Bldg., S. F.
Monarch Metal Weather Strip, Boyd & Moore, Agents .....356 Market St., S. F.

WHITE ENAMEL FINISH
"Satinette," W. P. Fuller & Co.,
S. F. and all principal Coast cities
Velvo-Tone, Wordeo-Meeker Varnish Co.,
S. F. and Oakland

WINDOWS, REVERSIBLE, ETC.
Tabor Sash Fixture Co., Boyd & Moore, Agents.....356 Market St., S. F.

WIRE FABRIC
U. S. Steel Products Company,
Rialto Bldg., S. F.

WOOD MANTELS
Fink & Schindler.....218 13th St., S. F.
Thos F. Rigney.....9 City Hall Ave., S. F.

WOOD STAINS
Bridgeport Wood Finishing Company, represented by Whittier, Coburn Company, San Francisco and Los Angeles.

W. F. AVERY, PROP. PHONE KEARNY 531

STANDARD IRON WORKS

ORNAMENTAL IRON BRASS AND BRONZE

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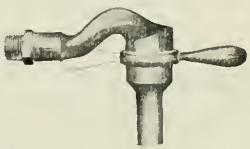

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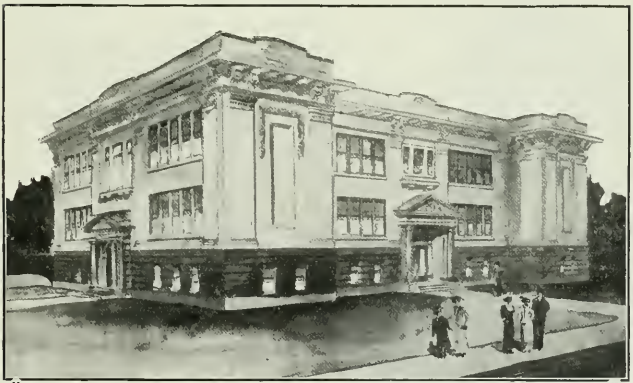

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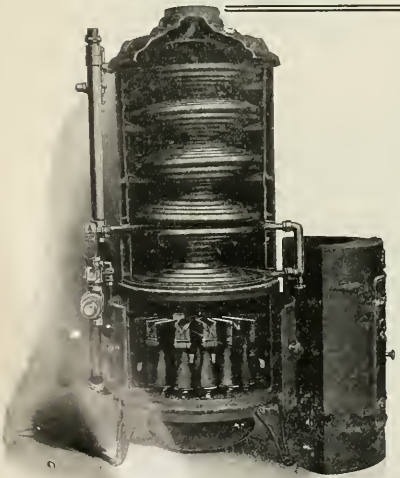

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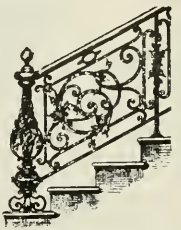

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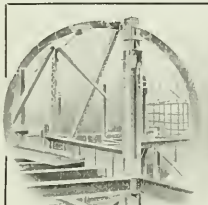

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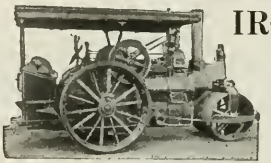

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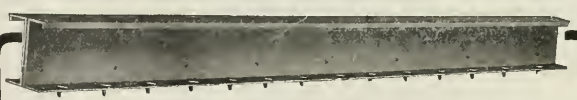

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HOTEL FACADE OF NEW TIVOLI OPERA HOUSE, SAN FRANCISCO
O'Brien & Werner, Architects

Frontispiece
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Of California

Pacific Coast States

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Suggestion for a Panel from a Photograph by Gabriel Moulin

Some Features of San Francisco's New Tivoli Opera House

BY EDWARD G. BOLLES.

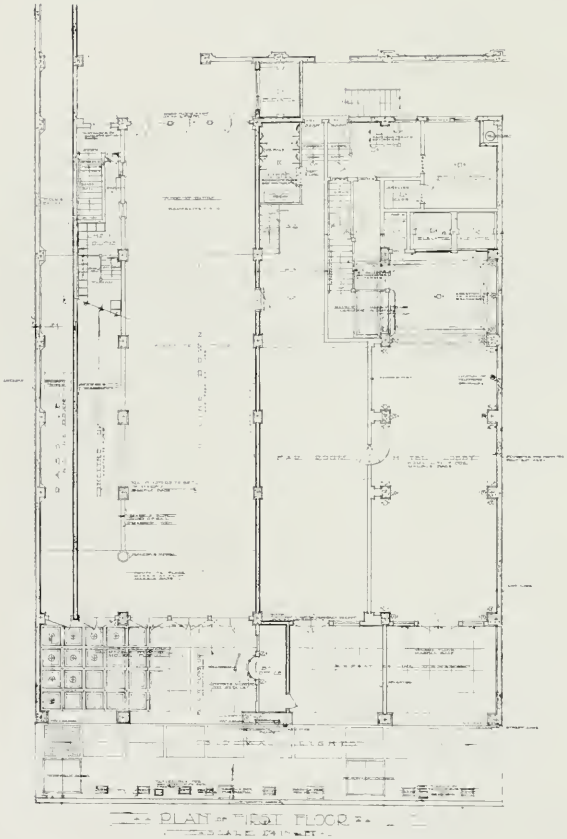
SAN FRANCISCO'S new Tivoli opera house and hotel building, construction of which will soon be under way on the site of the original Tivoli, will be a model of convenience and arrangement, embodying many features new to San Francisco theater patrons.

The hotel occupies that portion of the lot facing on Eddy street, and will be nine stories in height, containing a large lobby on the first floor with two fast running elevators serving the upper floors, which are divided into apartments each with baths and lavatories, and all the conveniences to be found in a first class hostelry.

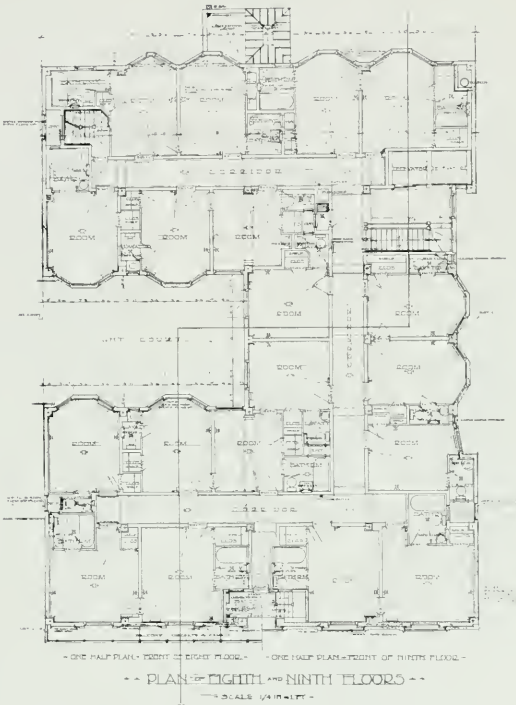
The entrance to the theater is through a wide vestibule leading from Eddy Street, and will be finished in California marble. A wide incline leads from this vestibule to the loge floor, thus giving patrons an easy ascent to this portion of the theater.

The lower floor is given over to the auditorium proper and will seat 950 persons. Directly over is the loge floor which completely encircles the auditorium and is divided into 21 boxes, each seating 8 people. Ample space is given to a promenade foyer on this floor and from it broad stairways lead to the balcony floor above. Here are seats for 700 people having a clear unobstructed view of the stage.

Above the balcony and forming the chief decorative feature of the interior, is a gallery which, to the patrons of the old Tivoli, will bring back memories



First Floor Plan Tivoli Opera House, San Francisco
O'Brien and Werner, Architects



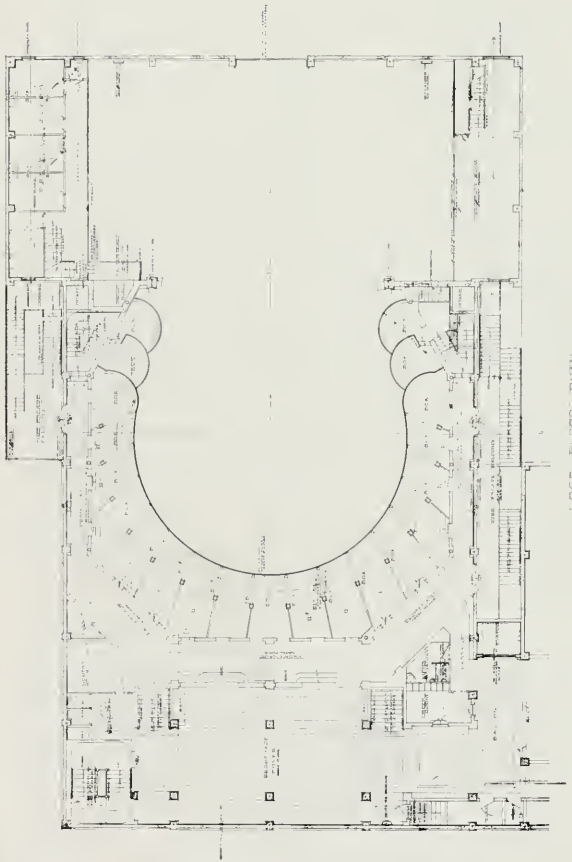
Eighth and Ninth Floors Tivoli Hotel, San Francisco
O'Brien & Werner, Architects

of the many evenings spent in the full enjoyment of the opera but free from the conventions and limitations of "fixed seats." Besides the usual wide stairways an elevator is provided to reach the levels of the different balconies.

Flanking the proscenium, on either side, is a pipe organ concealed behind ornamental grills and operated from the consol in the orchestra pit. The interior is to be carried out in Spanish Renaissance and, while not elaborate, is intended to be dignified and quiet in treatment.

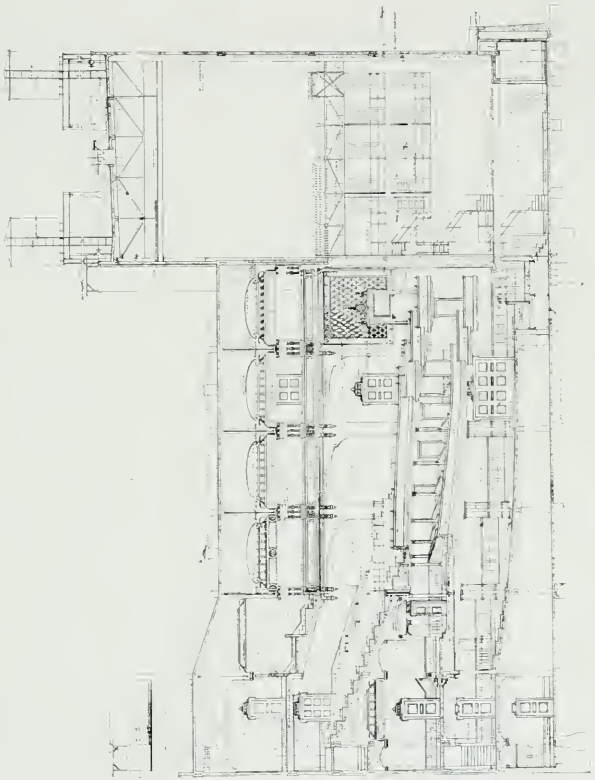
The interior lighting is to be entirely indirect. The ceiling is divided into panels by deep beams which support a lattice work over which is a false ceiling designed to refract the rays of light from the concealed lights, down through the lattice and thus spreading a soft agreeable light throughout the auditorium.

The stage is the largest of any theater in the city and equipped with the idea of handling grand opera in a manner never before attempted in San Francisco.



Loge Floor Plan, Tivoli Opera House, San Francisco

O'Brien & Werner, Architects



Sectional Plan, Twin Opera House, San Francisco — *O'Brien & Werner, Architects*

The Future of Architecture on the Pacific Coast*

BY JOHN GALEN HOWARD.

MUCH has been said and written in appreciation of architecture on the Pacific Coast as exemplified in the old missions; and we have even heard tell of the old architecture of San Francisco—sometimes with approval and sometimes with dispraise, but mostly with more vigorous anathemas than any other like quantity of achitecture ever received probably in the history of this or any other country.

We all know how charming the old Spanish missions are; how rich California is in possessing them, how fortunate we are that there remain even those few examples of the work of the old padres. They make the fertile valleys which they dominate delights indeed to the architectural student as well as to the general tourist. But perhaps it is less generally known how many delightful examples of beautifully simple, straightforward design of the early days in the way of solving the typical commercial problem were lost in the San Francisco fire. Those of us who, before the fire of six years ago, were wont to make pilgrimage through the streets of the lower city and rejoice ourselves in the delights of San Francisco's earliest essays in masonry architecture, are among the very few who realize that San Francisco had such a delightful group of structures. They are all gone now; things of the past, sincerely to be regretted. Far otherwise, with the triumphs of the jig-sawyer, which may be relegated to a well-deserved oblivion.

We hear of the architecture of today, too, sometimes. Those of us who have been seeing San Francisco rebuilt in no time realize that there is perhaps too much talk about the present day architecture, and that the less said about it the better, except it be to keep our courage up; we are at too close range to criticize it, to estimate it justly.

But, now, the architecture of the future—we are all interested in that. It is a thing of vital concern to us, and yet, perhaps, we don't think enough about it to give it a fair chance to come into its own. Are we making such preparations today as are likely to blossom forth in the next generation into a genuine expression of our Coast conditions? We do not give enough consideration to such possibilities, and I believe we ought to ask very seriously how our art of architecture should develop in this part of the world. We haven't looked at this subject in its proper light. We haven't given it its due importance. We have been doing things without any thought of what their effect would be in the future—what their value would be for future development. And yet, on the other hand, we are already really living in the future. We are already looking forward to the time when the Canal will be finished and people will come from all parts of the world to inhabit this coast which is still almost a wilderness, except here and there where men congregate together and build cities. This immense empire of emptiness will, we all believe, be settled up almost as soon as the Canal is finished. We are all looking forward to the time, near at hand, when our city, whichever city it is, will have a million inhabitants, or ten million inhabitants, as the case may be. We have fully-grown ambitions in that regard. Yes! We are all looking forward to the future, but we are not making much of any preparation for it.

Nevertheless, that future's character must depend upon what we do today. This is a time of preparation, rather than of accomplishment; of laying in foundations sane and sound, rather than of rearing a superstructure fair and free. We are using, and rightly, the old thoughts that were originally thought on the other side of the continent, and abroad, in the older countries, and we are using them under very difficult conditions—conditions that are so diffi-

*An address delivered at the Second Annual Convention of the Pacific Coast Architectural League, Los Angeles, April 10, 1912. Revised for the Architect and Engineer by the author.

cult at times as to seem almost impossible, professionally speaking. For the most part we are in reality simply pottering, getting along as best we can, from hand to mouth, so far as ideas and original imaginative power are concerned.

That is not the way in which to lay the foundations for the great architecture of the future. The time is coming, and is almost at hand, I think, when architecture on the Pacific Coast is destined to be the significant architecture of the world. Our friends, coming from the East, when they see the things that are being produced here on this far isolated island, as it were, at the ends of the earth, between the sea on one side and the desert on the other, wonder at what is being accomplished. And they go back and spread the good word and say, "We architects in the East must look to our laurels; the men on the Pacific Coast are forging ahead while we are standing still!" That is not wholly true, though it may seem so to them. They see things through a golden sunlight glamour. They come out here to have a good time and they see things with a kindly vacation eye. We are out of range of competition with them, too, and they see us with a more friendly eye than they see the work in their own communities—Philadelphia, Washington, New York, Chicago, Boston, or elsewhere. There is no personal friction to bias their judgment unfavorably; no personal end to be gained, which prevents them half of the time from seeing how good the things around home are. So we must not take their praise too seriously. At the same time, we must take to heart the significance of their tribute. Powers for good lie in that direction. To be heartened is to be strengthened, and on the foundation that we are now laying, the future of our architecture is necessarily to be built.

I want today to say a few words with regard to several different ways in which, it seems to me, we can do something for that future architecture. We can know nothing of it, naturally, in detail. We cannot see the precise direction in which our architecture is going to develop; we cannot even see what its general style and characteristics will be, nor, perhaps, define in advance just what direction we think it should pursue. What we can do is to improve the conditions under which that architecture, whatever it may prove to be, may develop; so that it may develop freely and sincerely into a true style which shall be an intelligible, suitable, harmonious and beautiful expression of the actual physical and intellectual conditions of which it is the flower.

First of all there is one set of conditions which we have absolutely in our own hands to control and to fix. Those are what we may call, speaking largely and broadly, professional conditions. We want a better professionalism on this Coast than exists at the present time. My mind may go back twenty or twenty-five years and visualize the conditions that existed in New York and Boston—the two towns with which I happened to be most familiar, for there my early life was spent—and I can recall how distressing many of the conditions were which obtained at that time, though there were many architects who wanted to improve things. And I have been familiar with the changes which have been going on there during the period within my memory. Professional conditions there are immensely improved. To be sure, affairs are not quite on a Utopian order even yet. There are difficulties; there are distresses; there are dissatisfactions; there are frictions; and I suppose there always will be. But on the whole the profession has got together to such a degree in our eastern communities and especially along the eastern seaboard, from Washington to Boston, that there is such a thing recognized even among the laymen, as professional conduct. And attacks upon proper professionalism, and attempts at seduction from proper professional practice are very much less frequent now than ten or fifteen years ago. The intelligent layman perceives that he has nothing to gain and much to lose by attempting to get results under unprofessional conditions of employment.

On this Coast professional conditions now are hardly equal to what they were in New York and Boston twenty or twenty-five years ago. And yet, the architects have absolutely in the own hands the making of those conditions what they will. We should have better conditions in order that we may produce better art, and in order that we may do fuller justice to those who come to us as clients, and in order to serve the community better. Better professional conditions will result in better art, and better service in every way because they will make the architect more self-respecting, and enable him to devote himself to rendering the service rather than to getting the work.

There is one type of unprofessional conduct which is rampant in our town (San Francisco), and I dare say is not wholly unknown in Los Angeles, Seattle, and some other cities of architectural activity; and that is "butting in." I call it by the only name I know for the practice—a slang expression which has no equivalent in good language, any more than the thing has a place in good society. When the slang expression gets so worn that it can be given up, the practice itself will be obsolete. If we could only get rid of the attempts among our fellows to snatch work from one another—if we could only get each one of our profession to recognize that he has no more right to take from another architect a piece of work which has been given to him than he has to go into his house and steal his table silver, then we should begin to have what is really decent and reasonable professional feeling. Until such recognition is general, we never shall have tolerable professional conditions.

This seems almost a commonplace; but it has to be said, and the reason it has to be said is because this sort of thing is going on all the time, under our very eyes. We are all aware of the fact it is going on, and yet nothing is said about it. Now the time has come, I believe, when it is proper and necessary to speak frankly and straightforwardly about these things. Let us have it out in a friendly way among ourselves, and call a spade a spade. This Architectural League of the Pacific Coast has a great opportunity to accomplish a fine work in that regard. All it needs to do, I believe, to correct this abuse, is to speak of it in a friendly and frank spirit between man and man, and between individuals and the gathering of his fellows. I know that it is so among the architects in San Francisco. We have recently instituted a Committee on Practice which is expected to take up individual cases of unfair, unfriendly, unfellowly conduct, whatever the breaches of professional principles may be; not in a spirit of censoriousness, not in a spirit of detective work, not in the spirit of "muck-raking" in the least; but merely to get together on a fellowship basis and to have it out with each other so that we can look each other in the eye and say, "You are my friend; I will stand by you," and "You are my friend; you will have to stand by me." The work we do under the existing unfavorable conditions is not what it should be, or what it would be if each man felt he could devote himself wholly to his work without having to safeguard and spend his time holding his work. That applies to pieces of work that are given outright to a man—of course, by far the greater number of cases; but it applies even more, if possible, to work which is won in competition. When a man has won a fair competition he should have absolute assurance that the work is his, and not that his work is open to the scheming and "wire-pulling" and "pipe laying" of other members of the profession to get it away from him into their own hands. This is a question of the simplest fair play, it would seem. But we all know flagrant cases in which fairness and justice have been ruthlessly flouted; and yet nothing is done to discountenance such outrages of common decency. No beauty in the building which results from such methods is sufficient to justify the means taken for securing the work. It must stand as a permanent monument to the unscrupu-

lousness of its author. And what is still worse, the buildings so secured are in many cases alleged to be as open to suspicion in their construction as in their author's means of getting them to do.

The question, too, of competitions themselves—I understand you have very recently, yesterday in fact, taken definite action with regard to certain practices in the line of competitions and that there is a promise of better times coming in that regard. I believe there is a definite promise of good times coming when any body of architects get together and say, "We will not submit to conditions of competition which are not fair to our profession, because we can not do justice to our clients or to ourselves under such conditions." There is a type of competition which is required by the law of this State, in certain cases, and which is so contrary to the interests of the community, that work of this sort should be ruled out absolutely from his office by every self-respecting practitioner. The time is coming when we must get changed the law of the State in this regard. I refer to the law of 1872 governing school buildings under certain conditions, to be given out by competitions which are on the very face of them so contrary to the interests of the community, so unfair to the profession that no architect should think of going into them. And yet every day members are going into them or asking, "May I?" or "Is there a chance of getting through without criticism if I go into the competition?" And these competitions require the filing of a bond by the architect—a bond which so ties up the architect with a contractor that he can't call his soul his own! Let us put a stop to that. All we have to say is, "We will not accept those conditions," and we can get the conditions changed. To be sure, we have to do a little bit of hard work. We have got to go before the Legislature and see that the proper influences are brought to bear to change the law; the State won't do it otherwise. Just what new law must be substituted for the old remains to be seen. That should be a matter for committee work, and committees should be appointed from every one of the Architectural Associations of our State and cooperate, one with the other, and get something done. We have recently appointed a committee on legislation in the Chapter of the Institute in San Francisco. I fancy there is such a committee in the Chapter here, and hope there is one in the League; but if there are not such committees, they should be appointed at the earliest opportunity and work together with a definite purpose for accomplishing a definite result.

Then the old-fashioned habit of "knocking"—what more detestable vice is there in our profession? I speak of San Francisco, and San Francisco has a most unenviable reputation as the "locus knockerorum"; but I understand there is more or less knocking in Los Angeles, too, and perhaps elsewhere—who knows? An honest, friendly criticism to a fellow architect's face, and above board, is a desirable thing, if it is intended to help matters. It is a friendly act. But to "knock" behind a fellow architect's back, to run down his reputation and to "black eye" his work, is a thing that is altogether too common among us, and a thing we ought to frown down. Destructive criticism is of little or no use anyway. Only yesterday the design of a great building was put before a group of architects of whom I happened to be one, by the representative of the owner, with the request that we criticize it. The position we took was, that we should be glad to criticize it if he would just put us in communication with the architect. The owner's representative might come with him if he liked but let us talk with the architect personally. We would not talk behind his back.

Creative criticism is the only kind that is worth while, and creative criticism we are all willing and glad to give, providing it is a friendly, good-fellowly relation that is established and not back-biting criticism which tends to weaken

a man's position and destroy the good that might be accomplished by the criticism.

The old question of proper charges comes in here, too; it has an important bearing on mutual relations among fellow architects. From one point of view any architect has a right to do his work for any figure he cares to charge, no matter how low; but two considerations are of the greatest weight in this matter. The first is that, as is well known, the profession as a whole has, by long experience, and in view of the best interests of all concerned, client as well as architect, agreed that the architect's full service, under the very exacting conditions of today, and the high cost of producing the work, cannot be properly rendered without loss, or, at any rate, without inadequate compensation, for less than 6%. The American Institute of Architects has therefore fixed that rate as the minimum proper charge; and members are expected to adhere to it. The San Francisco Chapter, and other similar organizations on this Coast, have adopted the same schedule, and it is the duty of all members to practice in accordance therewith. It is not too much to say that any member who charges less is by that very act practically certain to be competing in charges with some fellow architect if not with the great majority of his fellow-members—one of the most unprofessional things he can do. We are not shop-keepers—we are professional men, in duty bound to establish safeguards round the heavy responsibilities of the architect's service. Most of our members are doing the honorable thing and standing by their mutual agreements in this matter of charges. But statements are frequently made that many of our members are not doing so. If it is true, such architects are treading on disagreeable and dangerous ground and should be made the subject of fellowly criticism and correction to say the least.

We have a system of certification in this State, and it is based on a sound principle. That whole system of certification should be strengthened from top to bottom. We should all stand behind the State Board of Architecture, supporting its efforts to raise the standards of our profession and enlarging its work in every possible way.

There are numerous attempts to get around the State Board of Architecture, and incidentally, the Board is not as strong as it ought to be. But why isn't it as strong as it ought to be? It is because we don't stand behind it and back it up and see that its rules are really adhered to. We have men who are practicing architecture in the State without certificates and others who have had certificates but have allowed them to lapse. The only reason they are not prosecuted in a court of law is presumably because there are no funds with which to supply the ammunition. I know one or two cases—one which particularly happened to come within my knowledge—of a well-known architect who let his certificate lapse by reason of non-payment of dues, who simply snapped his fingers at the State Board of Architecture and went on practicing. He told me himself he had quite forgotten about the Board of Architecture for several years. That ought not to be. The State Board of Architecture represents a certain principle, and that principle can obtain and be recognized in the general community only in the degree that we ourselves recognize its value. Support it—strengthen it, so that it can go on to further accomplishment.

Instead of wiping out that principle, as some architects might advise, because the standard cannot all at once be set as high as desirable, I say we can make certification mean a great deal more than it means today, and the time for it has come.

The architect should be more generally recognized at his real value before the law. At the present time he is scarcely recognized at all except in a back-handed way. Let me mention one little example. The San Francisco charter,

which was got up some ten or twelve years ago with the idea of being a model city charter, uses the word "architect" only once, and that in a very secondary way—it does not use it in a direct way at all. It uses it something like this—All the employees of the city shall be subject to civil service requirements and examination, "excepting the city architect." The city architect is not even mentioned as an officer of the city! Well! I'm not so sure that there should be a city architect at all; perhaps it would be better for the city's architectural work to be looked after by private architects; but if the charter is going to provide for a city architect at all it should make suitable provision.

That is only one instance, but it is typical of what has happened all up and down the State. The architect is not recognized as a professional man. He is not recognized as a necessary element of the community. He is not recognized as one of the most essential contributors to the community's well-being. Laymen look upon architects, in many cases, as a necessary evil. Well! he is something better than that, as you all know, but we have got to bring all our power, all our influence, to bear on the laity, and upon the community, and have the architect properly recognized. Until he is properly recognized, he can't do his work properly for he is wretchedly handicapped.

The position of the state architect is even worse than that of the city architect. We are living in this supposedly civilized State of California under a system which puts the state architect in the position of being a mere hireling of the state engineer. That condition is an absolutely intolerable one—in this you will all agree with me—and yet we accept it without a word of protest. We are going about our private business and never wasting a thought upon the unfavorable condition governing the architect who has charge of the great bulk of the State's building. This is not a personal matter—I am talking about the principle. The state architect ought to be, if there is going to be a state architect, the head of a separate department and not a mere employee of an engineer. If anything, the engineer ought to be employed by the architect, but at any rate, the architect ought to be independent. Doubtless there is room for the state engineer, too. I am not questioning that. Least of all, am I criticising any personal incumbent of that office. What I am addressing my remarks to is the false principle upon which the state architecture is standing today. It is a situation which it is our duty to clear up. It can be cleared up only by our concerted efforts.

Then that great work of education—education of our younger fellows, and education of the public. Mr. Rosenheim has given us an admirable outline of the work that is being done and work that is being attempted by this League, but we are not doing enough. We ought to be ambitious to enlarge our educational facilities, not only in our schools, but in the attention given by individual practicing architects to helping along the younger men in their offices. A great deal is being accomplished, but not nearly enough. The efforts are too sporadic. They ought to be correlated into a great unified movement for the uplifting of our art and profession. We ought to offer better inducements for our scholars. The suggestion of Mr. Kelham, which was just read, that we induce fifty men to contribute twenty dollars a year for three years in order to guarantee a scholarship prize for that period—this is in the right direction. But we should expand the work, enlarge the field and put our whole heart and soul into the effort. We can do that only by working together and by working with absolute enthusiasm and sincerity.

And we have to educate the public as well. It all comes down, most of what I have said, to a question of education, of the profession, and of the public. We don't have enough evidences of the best that may reasonably be expected of the architectural profession. A very large part of the progress

made in the East in the last twenty-five years has been made because of the interest that has been aroused in the public mind by exhibitions, which have become more and more influential. The standard has been raised from year to year, until it is now really high. After a lapse of some years since the last exhibition I happened to see in New York, I was astonished and gratified last winter at the Architectural League. The exhibition was smaller and much more select, and that was by reason of raising the standard. There were fewer things on the wall, but the things that were there, for the most part, were things of vital interest and genuine beauty. There is no reason why our exhibitions on this Coast should not be just as good as the exhibitions in New York. But are they? Not a bit. We haven't set any standard; nothing that indicates that we have a definite opinion as to what constitutes good work and what constitutes bad work. The line is very difficult to draw, to be sure, between good and bad—different men would draw it in different places. But after all, we really can agree if we are willing to face the situation. Draw the line somewhere. Draw it up as high as you can—nothing below a certain standard to be exhibited. Put the big work in prominent places and make the exhibition tell, for all it is worth. Don't be afraid of offending because you have turned down something. You often help a man by not hanging his work. You can't at once set up a high standard for the public or for the profession; you can, however, in the course of a very few years, set up such a standard that the profession itself will be raised and the public enlightened.

If we look after all these things the future will take care of itself. Who cares what the style may be? Call it Mission, or what you like. If it grow naturally out of the conditions of this wonderful country and if we provide for it an environment and a nourishment of genuine professional feeling, it should be the finest style the world has yet seen.

* * *

Schools of Architecture

THE introduction of achitecture as a course in our Universities is a step in the right direction and yet one doubts whether the vocation is not sufficiently comprehensive for separate colleges confined to this one profession. It is true that a draftsman after a few years at the drafting board often sets himself up as an architect, but he is more often one in name rather than in fact.

To trace well the patterns set for him is an accomplishment but it does not make an architect of a draftsman. Wide and varied knowledge, skill and experience are essential for the true mastery of his profession. To be a good designer is necessary, but it is equally important to be a good constructor. He must do more than produce the roughly hewn stone—he must bring forth the perfect figure. His is a profession which requires peculiar versatility—so much so that it seems to dwarf every other branch of artistic scientific accomplishment. An architect, besides being a designer and draftsman of mechanical ability, must be an artist as well, as he is producing pictures more permanent than those on canvas—he is helping to mould an era which will be in advance of all that has preceded it in beauty of conception and permanency in construction. To meet all the requirements of his exacting profession, he should be a civil, mechanical, electrical and landscape engineer. He must, further, be an expert and specialist on heating, plumbing, ventilation, lighting, sanitation, fire protection, acoustics, refrigeration, vacuum cleaning, furnishing, seating, decoration, etc. He is held responsible for results and failure in any particular to secure good workmanship and the use of the best materials will reflect upon

him and lower his standing. Consequently, he should have a general fund of practical information and knowledge of every branch of building, including masonry, bricklaying, carpentry, painting, roofing, plastering, concrete construction, metal working, wood turning, etc.

Besides being technically perfect he must have a fair business training, keeping posted on building laws and on contracts, surety bonds, liability insurance, etc. Also, he must estimate correctly and prove himself a good accountant and bookkeeper, so that his clients will find that his forecasts of expenses are verified by actual cost.

After the plans are approved and building decided upon, every step of the work makes new demands upon his knowledge and experience. The building may be any one of a dozen different varieties—warehouse, church, school, theater, club house, hotel, apartment house, public building, hospital, store and office building, residence, garage, etc. Each one offers different complexities. In the larger buildings, the foundation problems must be first considered, such as borings, pilings, tunnelings, etc. On top of this, weighty matters such as concreting, reinforcing, facing, fireproofing, etc., must be carefully weighed and decided upon. To meet these requirements, he must have a knowledge of materials (steel, wood, brick, stone, granite, sandstone, concrete, terra cotta and marble), also the fabrication, bending, turning, moulding, carving, etc., of these materials, as well as of copper, brass, wire, bronze, and clay.

Then to have the basic materials right is no more essential that to have them set together and set up in a way which will last and he must be posted on and able to discriminate between the various brands and qualities of sand, gravel, rock, lime, cement, plaster, oils, varnishes, enamels, wall finishes, dampproofing compounds, waterproofing cements, anti-corrosion solutions, brick and cement coatings, shingle stains, putty, floor dressings, etc. He must watch out for the sheathing, deadening, damp-proofing, waterproofing, glazing and roofing, and to have the building defective in any of these points would condemn it as a whole.

The frame being up, the matters of equipment, fixtures, interior finish, etc., are to be considered. The one subject of the equipment may demand an enormous ammount of time and knowledge, for it can embrace power plant installation; heating and ventilating systems; lighting and wiring; automatic sprinklers; vacuum cleaning plant; elevators and dumb waiters; refrigeration and cold storage; fire extinguishers, fire escapes, fireproof doors, windows, etc.; garbage ejectors; heat regulators; vaults and safes, etc., etc.

The subject of fixtures is almost as perplexing, for in these days of modern plumbing and lighting, these alone offer fields for careful study and inspection of the newest types. Also the cabinet work, the ornamental grills, cornices, mouldings, etc.; the ranges, gas logs and fireplaces; the latest style of hardware; the use of door openers, door closers, door hangers and joists; adjustable windows, Venetian blinds, awnings, lockers, disappearing beds, tower clocks and window screens, not to speak of laundry and kitchen fittings—all these must be separately passed upon.

Finally, comes the interior finish—the wallpaper, painting, ceiling decoration, shades, hardwood, tile or composition floors, art glass, etc. In many cases the hangings and furniture are included in the general plan and some very creditable results have been secured by leaving this also to the architect.

Indeed, for a man to build from plans of others than an experienced architect is to invite disappointment and disaster. Let the contractor stick to his vocation—the carpenter to his, and leave to the architect the planning of the work. Let the capitalist choose carefully his architect and then hold him to strict accountability for results. To be your own architect is worse than to attempt to be your own lawyer. "Let him not venture where angels fear to tread."

First National Bank Building, San Francisco
Willis Polk & Co., Architects

The Art of Designing Commercial Buildings

Commercial Architecture Defined From the View Point of the Professional Man

CHARLES H. BEBB, F. A. I. A.*

Smith Building, Seattle
Gaggin & Gaggin, Architect

IT may perhaps be conceded that commercial architecture as differentiated from ecclesiastical, residential and monumental architecture, may be described as the art of designing business buildings, the buildings that line our public streets and fill our manufacturing and warehouse districts. It may also be conceded that a commercial building is primarily a utilitarian and business proposition.

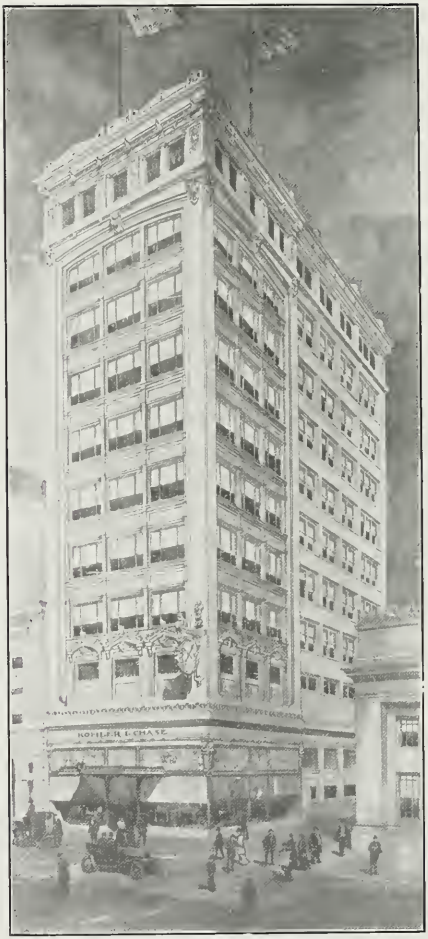
It is necessary, therefore, that an architect, to be successful and capable of maintaining a high professional standard, must be able to meet his client first and foremost on utilitarian grounds and convince him, that from that standpoint, his services are necessary and valuable and that by his expert knowledge in the manifold intricacies of modern construction and design, his employment will mean a resultant benefit to the client's pocketbook.

It must be admitted that the "commercial" building public knows little and cares less about art or architecture. It is not surprising, therefore, that the standing of the architect with this class of client is very indifferent, from the fact, that without due consideration or analysis, he sets him down in his mind as something of an "artist" and a dreamer of "things beautiful." When the necessity arises for his employment, the client is more often than not a skeptic. He is from Missouri, and in all things pertaining to the building, it is a case with him of "show me."

It is not at all an uncommon occurrence for a client, after the architect has completed his plans, and specifications, to make secret investigation of them. He will consult (gratis of course) some friend in the steel business as to whether or not there is too little or too much steel in the building. Possibly a friend in the plumbing supply business (on the same terms) to inform him whether the plumbing system is laid out correctly and where money could be saved, or some self-created heating expert, possibly the agent for the sale and installation of a patented system of heating, as to the heating system. And so on down the line. All of which tends to show that there is a woeful lack of confidence on the part of the client toward his architect, and that he approaches the enterprise of erecting a commercial building with trepidation.

In the matter of design the client is very apt to say: "I want you to understand that you are not building a monument to yourself, and I want you to cut out all fuss and gingerbread." This is probably as far as his instructions on this point will go, unless he has some preconceived notions as to materials, or colors that he wishes selected.

This article was written for the Pacific Builder and Engineer of Seattle, to whom we are indebted for the use of part of the illustrations.



Kohler & Chase Building, San Francisco
Frederick H. Meyer, Architect

National Realty Building, Tacoma
Heath & Tuthell, Architects

A further disturbing element that adds to the confusion and unrest in the mind of the client, particularly out here in the west, is the unfortunate fact that he is always ready to listen to some self-styled expert who calls upon him and tells him how he can save money and economize by using this system or the other. No sooner does the press announce that Blank & Company will improve their property, and have selected Jones & Jones as their architects, than they find the volume of their mail perceptibly increased, and are daily favored with calls from "experts" whose sole object, apparently, is the benevolent one that they have come to save them money, if their particular form of construction, or system of heating or plumbing, is adopted and their architect is instructed to use it.

It is not intended by these remarks that the client should not use every business precaution and careful considerations not only in the inception, but in the development of the undertaking. There is, furthermore, no doubt of shortcomings both among the older as well as the younger members of the architectural profession.

How then can the relation, between the client and the architect in commercial undertakings involving the employment of the latter be ameliorated?

The first step toward this end is to thoroughly inform the building public what an architect, of high professional standing, really does for the fees that are paid him. The measure of the success of the architect who does commercial work is the measure of the success of the buildings he erects. The modern commercial building of today is a complex study. It involves a thorough grounding in the sciences that are comprehended in the term "building engineering." It is safe to say that no man is an expert in all of them. The competent architect knows his own limitations, and when a problem arises in any branch beyond his own powers of solution, he employs a special expert in that case for the protection of his client's interests.

The building when completed must be a harmonious whole, a smooth running, economical working machine.

The client has the right to and should expect the solution of his utilitarian project in terms of beauty. It must be utilitarian first and beautiful afterwards. If a client instead of building was purchasing, and two buildings were offered each costing $100,000, each having the same rentable area and the same working facilities, the one well designed and harmonious and attractive in its ap-

Union Trust Building, Los Angeles
Parkinson & Bergstrom, Architects

pearance, the other common-place and disturbing, which would he purchase? Herein lies the commercial value of good architecture considered only from the standpoint of the spirit of the present age.

The trained architect of experience brings to bear upon the solution of the problem of design, elements of thought and study, the details of which are not of interest to his client. It may safely be said that he is conscientiously working at all times with due regard to the needful economy of cost insisted upon by the client.

The building to be designed must have the utilitarian element in its conception, in other words, the design must fit the purpose for which the use of the structure is intended. The relation of the design is considered in regard to the location. It should harmonize with the surrounding buildings, if others exist in its vicinity. Incongruity in design of adjacent buildings destroys the very much needed harmony in our streets. A trained architect is not above subordinating and restraining his own individuality in the matter of design in order to produce the best effects in the interests of the general impression in relation to the street. Widely divergent types or "styles" of architecture should not be erected in juxtaposition. Heights of buildings may and will vary, but their color schemes while not necessarily the same should be in harmony with each other.

The Hoge Building, Seattle *Bebb & Mendel, Architects*

It must not be considered that a uniform monotony in street fronts is advocated, but a warning is intended against erecting some vulgar monstrosity entirely out of keeping with its adjacent neighbors. Diversity in monotony is recognized as a principal of natural beauty. May it not apply equally in the upbuilding of our street fronts? It belongs to the architect to elevate the standard of public taste in design. If the true meaning of architecture is the expression of ourselves, it is time we avoided caricature and the "motley" in our buildings.

Old National Bank Building, Spokane
D. H. Burnham & Co., Architects

Mills Building, San Francisco
D. H. Burnham & Co., Architects

It may be granted that the prosperity of a community or city is evidenced by its buildings, but the measure of the intelligence of a community will be judged by the nature rather than the extent of them.

Enlightened reason, and underlying sense of beauty are the first essential elements in developing good architecture; as the building public becomes more critical acquiring by precept and good example, a better knowledge of beauty and utility in matters architectural, so shall we have better buildings and our cities become more simple and dignified and reposeful.

Aside from the question of plan and design the successful architect must have acquired a thorough business training. He it is who handles the business end of the undertaking, watches the construction of the building, safeguards with due vigilance the financial interests of the client in the cost of the building, issues certificates against the owner in payment of the contracts and is responsible for their correctness.

The architect who faithfully performs all of these services is certainly entitled to the complete confidence of the client, and having it can always produce the best results.

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The Australian Capital Competition

A news dispatch from Sydney, Australia, reads as follows:

"The designs for the Federal capital have been reduced to a dozen, most of them the work of Americans, Frenchmen, or Germans. The adoption of a radial plan is likely.

"The British designs have only a small chance."

A College Education for the Draftsman

BY GILBERT STANLEY UNDERWOOD*

THE University of Illinois is the Mecca of Education for the self-supporting man. It is said that fully fifty per cent of the students at the University are self-supporting and that at least ten per cent are self-sustaining during the school term.

The commonest position of the self-supporter, is that of waiter at one of the boarding clubs, fraternities or sororities or "counter hop" at one of the near by restaurants. For his services at the three meals during the day, he is given his board, and on occasions of banqueting or special service he is paid extra in money. Dishwashing three hours a day for board is another source of support.

Students are able to earn the use of a room for tending furnace in winter and mowing lawns in summer. Positions are constantly open in the various departments of the College at twenty cents an hour. This is not large, of course, but in comparison with the cost of living, it is not small. Jobs at window washing and house cleaning, work on the agricultural farm, clerkships in stores, and various odd jobs afford abundant opportunity for support to the man who is not too proud to work

In summary, it is safe to say that a man who can come here with a hundred dollars a week ahead of opening, with ambition and a desire to work, and who has not an over-developed love for peg-top trousers and girls, may easily go through the University of Illinois.

Of course, this above is written primarily for the draftsman, but it applies to any other class of student as well.

The curriculum of the architectural course may be gotten from the catalogue for the asking, so I shall not dwell much on the various subjects. The head of the department, Prof. F. A. Mann, is one of the foremost leaders in the profession in America. Prof. Mann is late of Washington University. Associated with Prof. Mann in the department of architecture are Profs. Varon, of Paris, Jones, Dickhutt and Forsythe with a large corps of assistant professors in the various art and construction departments. I think most of the fellows will be interested in design. It may be well to say, though, that a man may not go out of Illinois a poor constructionist. No school in the country holds a greater reputation for engineering.

The freshman year in architecture, is a most valuable one. I was fortunate enough to enter with advanced credits, but if time were not a serious consideration, I should like to complete all of the freshman work.

Students in design are given problems very much after the fashion of the Beaux-Arts Society, but with the difference that they are required to make there researches in the library before preparing the esquisses. The work on the problems must be developed to certain stages each week, and sketches of library material must be turned in weekly. In this way the student develops ability to make useful researches and gains a comprehensive vocabulary of ornament and decoration. The final problems are judged from the standard of design, composition and rendering, very much on the same basis that the Beaux-Arts problems are judged.

Some very interesting problems have been given this semester, a bank, flower pavilion, Gothic chapel and a crematory and columbarium are among the most interesting ones.

*Mr. Underwood is studying architecture at the University of Illinois. The accompanying notes are selected from a letter written by him and addressed to the members of the Los Angeles Architects' Club, of which he was an active member prior to going East. While in Los Angeles, Mr. Underwood was in the office of Architect A. B. Benton.

During the first semester of the sophomore year, a house is designed in wood and the entire working drawings are prepared. In the second semester a rather good sized building in stone, steel and concrete is put into working plans. Most of the fellows who are at the stage of training that I was may easily get credit for this subject.

A most thorough course in charcoal, water color and pen and ink is a part of the curriculum.

History of architecture is gone into very deeply, as the faculty believe that an architectural education is not complete without a deep and comprehensive knowledge of style.

Each year of the architectural course carries along a current of general or cultural education, so that a man taking the four-year course receives a broad training.

I have touched briefly on some of the points that I think will interest the prospective student. Perhaps a bit of my own experience, which will in a way parallel that of some of the fellows who may come here, will prove of interest.

After arriving in St. Louis, broke, and pawning my watch to get to college, I finally arrived at Champaign and took a car for the Y. M. C. A. The University Y. M. C. A. is the almanac of all College information. I went into the library by mistake and was joshed a good bit by some of the upper classmen for my blunder. Some of those same upper classmen are now my own classmates in the architectural department.

The Y. M. C. A. furnished me with sleeping quarters for a couple of nights and finally settled me in Urbana in the biggest five dollars worth of room I ever saw. One may almost buy a full-grown house here for a very small sum.

The best board in the world may be had for four dollars a week, although one may eat at one of the local restaurants for as low as three dollars a week. Fifteen cents buys a complete meal.

I find the architectural course one of the hardest in the University. In proof of which I may say that I have burned the midnight oil every night since I came. There is no time for any of the famous Hotel de Paris or Campi dinners.

I discussed my course with an instructor entirely on the basis that I could spend but two years in special work. But before I had completed my registration, I had decided to finish the regular course. After finding how cheaply one might live, I have decided to not only complete the regular course, but to go on and take a Master's Degree. And I hope to crowd in a trip to Europe via cattle boat during some of my summer vacations. Nothing stimulates the desire for knowledge, like more of it. I figure on two years in Europe as a finishing course.

It is astonishing to find how many men come here to take the special course, and under the stimulant of environment, finally change to the regular course and take their B. S. degree. The realization that an architect must be more than a designer or a constructionist, that he must be a broadly cultured gentleman, with some sympathy with and knowledge of humanity, is dawning more and more on the architectural student, and he is reaching out and grasping all the opportunities for broadening that present themselves. I cannot name a school that is richer in these same opportunities, than Illinois. One of the young women architects in the department is making the study of astronomy and psychology a part of her course.

The social side of architecture is not neglected. The Architect's Club is among the strongest student organizations in the University. Under the auspices of this society, well-known thinkers in the profession deliver weekly lec-

tures. Men like Irving K. Pond and others prominent in the field of architecture, talk on various phases of design and building. Social meetings of the Architect's Club are held at regular intervals. Open house meetings are open to all the students, whether members of the club or not. A play is given at the end of the term, and the professors are paid back in full for all the ills and aches they have inflicted upon the unfortunate (?) students during the year.

I think I have covered briefly, everything that will be of interest and benefit to any of my old co-workers who may be ambitious to climb higher into the realms, but who may be a bit doubtful about their ability to get through college. I can only say again that if a man can come here with a hundred dollars and a big capital of determination, together with a belief in the honesty of labor, he may graduate from the University of Illinois. It may be interesting to know that one of the chaps here with me as I write this letter, is a junior who has worked his way through for three years. He came here with less than fifty dollars.

Personally, I have been able to get more architectural work outside than I have been able to carry. The temptation is to do too much work at the expense of study and thus neglect the big purpose for which one comes.

Military service is compulsory for two years for men under twenty-five and physical training for one year. A student is not allowed to neglect his body any more than his brain.

* * *

Depositing Concrete Under Water

METHODS of depositing concrete under water have been studied during the past year by the committee on masonry of the American Railway Engineering Association, and certain conclusions on this subject are presented in its report on the basis of replies to a circular sent to a large number of railroads.

It is found that nine methods of depositing the concrete are included in the replies, which are: Bottom-dump bucket, tremie, sacks, sacks withdrawn, paper bags, open chutes, open depositing, pneumatic grouting of broken stone and concrete blocks.

The committee makes a series of observations in regard to general practice in this matter, which are substantially as follows:

Concrete may be deposited successfully under water, if so handled as to prevent the washing of the cement. Cofferdams should be sufficiently tight to prevent current through the pit, and the water in the pit should be quiet.

The concrete should be deposited in place either by means of a drop-bottom bucket or a tremie, and should not be allowed to fall through the water. Where a bucket is used, it should be carefully lowered to the bottom and raised to the surface, so as to cause as little disturbance as possible to the water. Where a tremie is used it should be kept filled with concrete up to the top of the water level, and the discharge end should be kept buried in the freshly deposited mass to prevent emptying, and raised a few inches at a time as the filling progresses. The surface of the concrete must be kept as nearly level as possible to avoid the formation of pockets which will retain laitance.

Where concrete is not deposited continuously, all sediment should be removed from the surface of the concrete, by pumping or otherwise, before depositing fresh concrete. The concrete should be a 1:2:4 mixture and of a quaking consistency. Freshly deposited concrete should not be disturbed.

Where the flow of water through the pit cannot be prevented, concrete should be deposited in cloth sacks.

Acoustics of Architecture—III.

BY ALEX F. OAKEY.

IT has been suggested that the articles on acoustics that appeared in The Architect and Engineer of California for January and for March, should have been prefaced by the writer's personal experience and achievement in the matter; and perhaps the incidents of the years of work and travel are of sufficient interest to warrant some account.

In 1872 I was retained as architect of a concert hall for Theodore Thomas, to be built on the present site of the Metropolitan Opera House in New York City, but the death of the principal financial backer of the project prevented its realization before the drawings were beyond the preliminary stage; not, however, before I had become so interested in acoustics that I determined, if possible, to understand the matter thoroughly. I read everything on the subject that I could come by in any language and I do not think that anything of importance that had been printed in the past hundred years escaped me.

What I read, while often very suggestive and valuable was so conflicting and generally so tentative that I undertook a series of experiments based upon the theories presented, and upon some theories of my own. I studied harmony and the construction of musical instruments, and armed with a siren, a violin, a tape, a thermometer and fifty spirit lamps, tried to analyze the various degrees of failure and success available in the cities of the Eastern and Middle States. My contribution to the science at this time was the spirit lamps, so made as to cause a flame about the diameter of a pencil and nearly as long. The action of this flame not only detected the least current of air, but by its varying height determined the degree of vitiation of air in every part of an auditorium.

Perhaps the most successful auditorium in many respects, but especially acoustically, that we had in the United States was the old Academy of Music (the opera house) at 14th street and Irving Place in New York, that was burned in 1868. This theater was successfully copied from the Royal Theater in Madrid and I was fortunate in being able to make exhaustive experiments in the original before it was also burned. I found these undertakings very trying and expensive, owing to the red tape to get a permit to begin with. Then the authorities and the insurance companies objected to my lamps; and when this was overcome by liberal tipping, not to say bribery, the police objected to my hiring an audience at so much per head. Without an audience I could not measure the vitiation of air from breathing and animal heat, and the absorption or deadening of resonance by clothing. The lighting and heating must all be in action also, and this involved the employment of the usual staff of the theater for this purpose, so that a properly complete investigation of the properties of an auditorium seating two thousand, costs with one's own indispensable assistants, about $400. This official opposition, interference and cupidity was always more or less prohibitive wherever I went, especially in Austria, Germany and Italy, though I ought to acknowledge the very cordial assistance given me by Tomaso Salvini in my experiments in the "Teatro Appollo" in Rome, and his kindness in giving me letters that were an "Open-Sesame" to the "Alfieri" in Florence and the "Scala" in Milan. In fact, without Salvini's influence and that of Dr. Valeri, who was at that time physician to Pius IX, I could never have got permission to make measured drawings of Paganini's Julius Guanarius preserved in the museum in Genoa. In Vienna and in Buda Pesth the official opposition was too strong for me, and I had to be content with drawings of the opera houses and such experience as I could get by sitting in various parts of the houses as one of the audience. In Ger-

many, however, I was not without friends and was given every opportunity, by paying for it, in Dresden and in Leipzig with the assistance of Schuloff the composer, and Herr Bouck, critic, though elsewhere I accomplished very little till I returned some years later as I shall presently tell. In France I was rather encouraged than opposed and made some interesting and valuable experiments in many places, especially at Nimes where the Roman amphitheater was partly used as an open air theater, a segment being housed in with boards ten feet high, including the portion of the arena used as a stage. Another segment of the stone bank of seats was used as a complete theater enclosed and roofed in the same way. There was no attempt at heating and the lighting was done with oil lamps, so that the conditions were very useful to make comparisons with data derived from the usual interior. One had to pay, as usual, but the evident desire to assist in every way was a great relief from the surly indifference and suspicious hostility I had struggled with so often. In Paris the expense was greater but the Press took me up and I was permitted to do as I pleased at the "Francais," where Francisque Searcy said the dome still vibrated with the tones of Rachel; at the "Italiens" which was then the opera, as Garnier's opera was still unfinished and I did not get a chance at that till some years later. I tried the "Vaudeville," the "Odeon," and the "Varieté" and was persuaded to write some account of what I had found out for the "Semaine des Constructeurs" and for "The Builder" of London, though I did not do anything there in acoustics till I came back to Europe in 1877. However, I went back to New York with an abiding sense that I had begun to understand what I had missed in every way in my student days in 1869 and 1870 fresh from my drudgery in Vaux & Wither's office for three years of 1866-7-8, though I had worked for R. Norman Shaw, A. R. A., and others, had circled the globe and had come to think that I had arrived. There is nothing like absorbed interest in a big subject to teach humility and the relative importance not only of related facts but of all things whatever. In 1876 I entered a close paid competition between Messrs. Ware and Van Brunt of Boston, Messrs. Hanaford and Proctor of Cincinnati and Mr. John McLaughlin of Cincinnati, for the Springer Music Hall and though I was not placed first, Theodore Thomas insisted that I should be retained as acoustic expert to work with McLaughlin, who very generously allowed me every opportunity to realize my contentions within the means at our command, and I believe that this auditorium, seating 6,000, is admitted by competent authorities to be one of the few acoustically successful extant, especially of such capacity.

Immediately after this employment I was persuaded to undertake a large commission in Santiago, Chili, and while there I rebuilt the Municipal Theater that had been gutted by fire. I was a good deal hampered by official parsimony and arbitrary interference, but I succeeded in avoiding the serious defects of the original auditorium and realized essential acoustic properties. I crossed the continent to Rio Janiero but I was too ill to attempt anything there and went back to Europe. I utilized much of my time while travelling to write articles on acoustics and other professional interests that were printed from time to time in the American Architect, The Builder of London, Van Nostrand's Magazine and Harper's Monthly, Appleton's Journal, etc., etc.

It was on this fourth trip to Europe that I was lucky enough to meet Sir Morel McKenzie, the throat, nose and ear specialist, and through him Prof. Helmholtz. These gentlemen taught me things and directed my reading to such purpose that what I already knew assumed new importance: These physiological facts illuminated and reconciled all the data I had collected and enabled me to reduce all my labors to practical working formulae. For the first time all considerations formed a thoroughly co-ordinated system that is practical

and universally applicable. The $40,000 or more that I had spent was after all not wasted; so that when Theodore Thomas consulted me as to the possibility of making the Seventh Regiment Armory fit for the great Music Festival of 1883, I wrote my prescription for the treatment of the diseases with absolute confidence that my diagnosis was true, as it proved. Here the resonant platform for the orchestra was first tried with a dampening pedal, and was so effective that Thomas used it often afterwards. I delivered an illustrated lecture on acoustics for the Academy of Science in Buffalo, N. Y., in 1880, and at Mr. D. H. Burnham's request wrote an address on the subject for the Congress of Architects at the Columbian Exposition, printed in the A. I. A. report of the proceedings.

The loss of all my records in the fire of 1906 prevented my being more exact in dates and describing many cases of failure that I have been consulted in, and some that I have been permitted to cure.

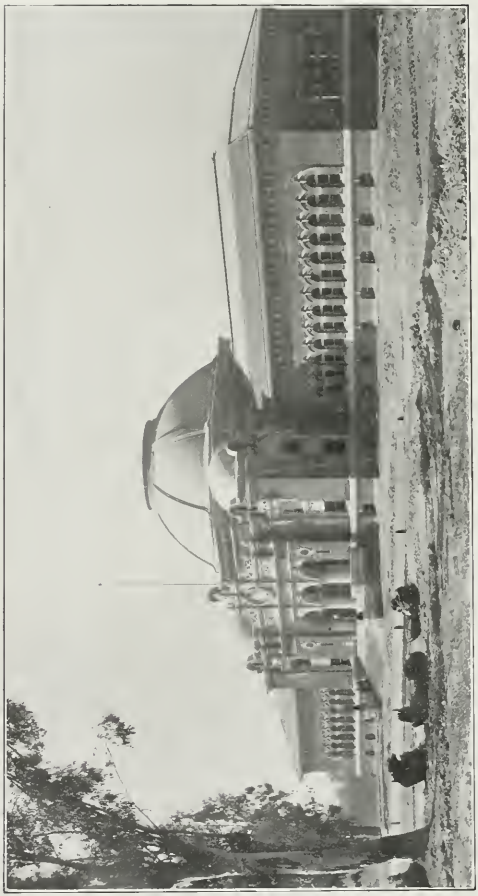
* * *

Selecting Wallpaper

THE great variety in wallpaper color and design renders choice a matter of difficulty. The importance of careful selection cannot be overestimated; for, however much skill may have been expended in the painting, the decorative effect will be a failure unless the tint of the paper corresponds. To many persons the most pleasing results are obtained when the tone of the ground of the wallpaper agrees with the tints of the paint; thus, if the door is painted in parti-colors, the panels should be painted in some tint contained in the paper, or at least one that harmonizes with it; and the same rule holds good with respect to the mouldings round the panels, if the mouldings are picked out a different tint, and also with respect to the cornice when that is distempered in colors. The use of graining on the woodwork of a room affords, of course, considerably more range of choice.

In any case it is a good plan to obtain the paper before the finishing coats of paint are applied; otherwise, it may be found (particularly towards the end of the season) that the paper chosen in the pattern-book may happen to be out of stock, when, if the paintwork has been finished to correspond with the particular paper chosen, trouble and annoyance may ensue.

To secure the best results, the painter should prearrange the exact finishing shades before putting on the earlier coats (especially when the tints are delicate), as he can then work up to the shade required. It is better to visit the showrooms of the manufacturers, where the paper can be inspected in the piece, than to choose from a pattern-book; often paper presents a very different effect when the whole of the design is seen from that suggested by the small sample. It is well to select first of all two or three patterns which seem the most suitable, and then to get pieces or long lengths of them, and have them held up on the wall so that the effect and general tone may be seen in daylight and gaslight; for many papers that look well in the daytime are anything but pleasant at night, while some of the darker-toned papers absorb so much light that when hung it may be found that the lighting arrangement in the room is altogether insufficient. Speaking generally, it is undesirable to choose high priced papers that are very pronounced in color or design, because decorative and well-designed papers can be obtained and easily renewed at small cost, whereas the renewal, as often as is desirable, of the high-priced paper is too costly a proceeding in most cases.



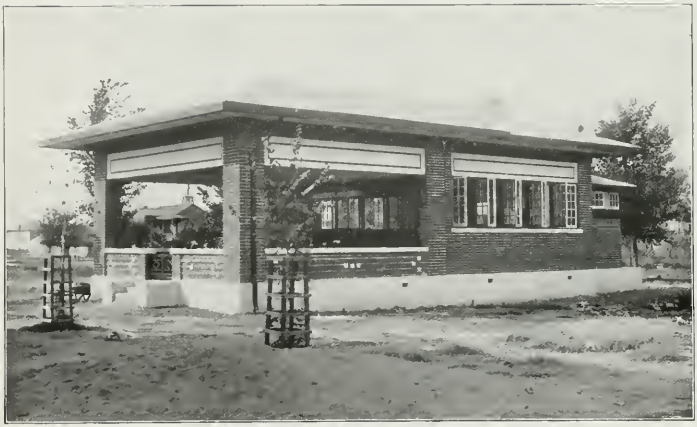
Exposition Building, Agricultural Park, Los Angeles — California State Engineering Department, Architects

Exterior of Open Air Kindergarten, Sacramento, California.

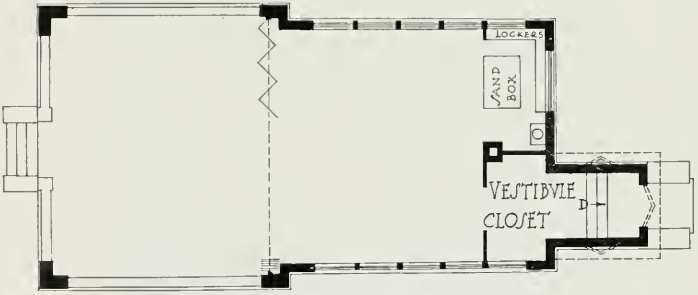
An Open Air School House

SOMETHING unique in school house architecture is shown in the accompanying cuts of an open air kindergarten at Sacramento, designed by Architect Pearson of that city. The building is located on the grounds of a public school and has enrolled thirty tots. Since the photographs were taken for the School Board Journal, to whom we are indebted for use of the engravings, the ground surrounding the building has been leveled off for play purposes and a section has been turned into a school garden.

Interior of Open Air Kindergarten, Sacramento, California.



Open-Air Kindergarten, Sacramento, California



Floor Plan, Open-Air Kindergarten, Sacramento, California

The building itself has a concrete foundation, brick walls, and a roof of ordinary wood construction.

The class is conducted mostly in the large, open porch, which is twenty-five feet square. The other part of the building is enclosed, but has very large windows, allowing good ventilation when inclement weather forces the children indoors. The closed part has large folding glass doors, which can be opened as desired.

In connection with the kindergarten several novel features have been introduced. Instead of the long tables usually found in modern kindergartens, two large circular tables with hollow centers have been bought. The tables are entirely new and have been found particularly effective. The teacher stands in the middle of the table and can more easily direct the class.

* * *

Progress in School Architecture

NO review of recent progress in American architecture would be complete without a consideration of the wonderful strides which have been made during the past decade in the arrangement, design and equipment of public schoolhouses. A comparison of the perspective and floor plans printed in the first Schoolhouse Number of the School Board Journal in 1901 with the material reproduced in these pages will convince anyone of the tremendous changes and improvements that have been going on.

The schoolhouse of today is not, like its predecessors, a succession of box-like rooms strung along a corridor and lighted by windows placed haphazard according to the fancy of the builder. The old-fashioned schoolhouse had little to attract children. Its rooms were bare and uninviting, and when they were not too cold and draughty for comfort, they were sickening with hot, stagnant air.

The modern public school has a simple exterior, depending for beauty upon correctness in proportion and outline, following one of the accepted styles of architecture. It is usually surrounded with the playgrounds and lawns, and in many cases, an attempt has been made at simple gardening and ornamentation.

The interior is arranged not only with a view of conserving the comfort and health of the occupants, but also to gain the highest possible amount of efficiency in teaching, management, and discipline and extra service for the community. The appointments are elaborate when compared with the old schoolhouse. Everything is made inviting and attractive and intensely practical. In fact, it may safely be said that the modern schoolhouse is in itself a positive aid to teaching and a strong factor in the civil and social advancement of the community.

The past year has seen much advance in schoolhouse planning and construction. A number of the states, notably Pennsylvania, have recognized a need for better schoolhouses by enacting very comprehensive legislation to guide architects and school authorities. The laws have sought to fix a minimum standard of excellence in lighting, heating, ventilation, and safety, and much good is already being realized from their provisions.

The district schoolhouse, although it has been neglected for years, is beginning to receive a share of the attention which the country school has been attracting. During the past year a number of states have followed the lead of more progressive commonwealths and have issued splendid plans and specifications of standard rural schoolhouses for free distribution. Local boards have been encouraged to make special efforts for improving conditions by financial aid from the state treasuries. In some states rather drastic measures have been

taken and miserly trustees have, through condemnation proceedings, been obliged to replace unsanitary buildings.

In the larger cities of the country there has been a general acceptance, during the past year, of an entirely new factor in schoolhouse planning. It is the adaptation of buildings to the social needs of neighborhoods for lectures and debates, and gatherings of young people, parents, voters and taxpayers, for use as branch libraries and recreation centers. Mr. Perry points out, on another page, some of the leading features of this movement. In smaller cities the high schools, more largely than the elementary buildings, have reflected this social center influence.

In general, high schools have grown into such great and complicated buildings that many architects and school authorities are beginning to ask whether the limit has not been reached in size and equipment. High school courses are more than ever becoming diversified and complicated. They are meeting more nearly the needs of communities and are truly earning the appellation "peoples' colleges." It seems that at no distant future date they must follow the lead of the colleges in erecting several buildings in a group.

In no branch of schoolhouse planning has there been more dissatisfaction than in heating and ventilation. Hardly a month has passed during the past year, but what some individual or organization has taken a "fling" in the public press at the condition of classroom ventilation. That this has been justified seems apparent from the studies which such prominent technical organizations as the American Society of Heating and Ventilating Engineers and the American School Hygiene Association have made. The tests which have been undertaken by the Chicago School Ventilation Commission and the studies which are being made in the East clearly indicate that engineers are themselves dissatisfied with present theories and practices. They have discovered many valuable ideas and will probably offer more tangible results during the coming year.

The greatest factor in the recent progress in school buildings may be attributed to the progressiveness of school boards who have been eager to adopt suggestions and recommendations from superintendents and architects. In the large cities there is no question but what the progressive spirit of school authorities and architects have combined scientific skill and artistic sense of a high order to make the public school houses models in completeness and convenience. The same appreciation and interest should be transmitted to every village and hamlet so that every community can boast economical, artistic and satisfactory schools.—American School Board Journal.

* * *

Keen-Eyed Engineer

An old engineer in the north of England was getting his sight tested by a doctor who lived in a house facing a large park. The doctor used to say to his patients, "Look over there and tell me what you can see." When the engineer learned that his sight was to be tested he arranged with his son to take his bicycle half a mile into the park and be oiling it. In due time the old man was led to the window, the doctor saying as usual:

"What do you see?"

The old man, peering out, said: "I see a young man stooping beside his bicycle."

"Do you?" said the doctor. "I don't see anything at all."

"Nonsense," said the engineer. "Why, he's oiling it."

The doctor took up a pair of field-glasses and plainly saw the same.

"Magnificent sight!" he said.

The engineer is still drawing his wages.

A Statute of Provincial Days that Ought to be Repealed

BY WALTER H. PARKER, F. A. I. A.

THERE appeared in the report of California Appellate Decisions, March 20th, a review of the case of F. W. Burki vs. the Pleasanton School District of Alameda County, which is practically the first decision of any kind based on the old statute of 1872 that can be found, wherein the architect was vitally concerned. This decision, handed down by the Appellate Court of California, of recent date, recalls that absurd statute which in some vague form or other is known to the profession, but which unfortunately was never enforced sufficiently to cause its absolute repeal. It also calls to our attention the fact that a law does exist in the statutes of this State and affects, or may affect, every locality and community whose legislation in such matters has not been superseded by statutes appearing in the Civil Code or by Charter form of government.

As many of our cities and counties are governed by special forms of government, according to classification as arranged for by law, the statute of 1872 may generally be said to have ceased to exist, and correctly so for those communities, but the law is as valid as it ever was in districts not so fortunate as to be regulated by more recent legislation. Certain parts of the decision of the Apellate Court are as follows:

The complaint in substance and effect alleges that the defendant, as the board of school trustees for Pleasanton school district, in accordance with the requirements of an act to regulate the erection of public buildings and structures (Stats. 1872, p. 925) invited architects generally to submit plans and specifications for the erection of a proposed new school building. In the published notice inviting the competition of architects it was specified that the defendants, as the board of trustees, were authorized to expend $26,000 in the construction of the building, and that a premium of three and one-half per cent of the contract price would be allowed to the successful architect upon the adoption of his plans and specifications, and that the architect whose plans and specifications were finally adopted would be required to superintend the erection of the building, for which he would be paid, in addition to the original premium, a fee of one and one-half per cent of the contract price. It was further specified in said notice, "that prior to awarding any premium for said plans and specifications, said board would require said architect to give a good and sufficient bond * * * in the penal sum of five thousand dollars, to be approved by the board of trustees, and conditioned that within sixty days from the date of said bond the said architect will, on presentation to him, enter into a contract containing such conditions and provisions as may be required of him by such board of trustees."

Within the time required by the notice plaintiff prepared and submitted to the defendants plans and specifications for the proposed building, and thereafter, it is alleged, the defendants accepted and adopted the same, and employed the plaintiff as the architect of the proposed building, and directed that he give a bond in the sum of five thousand dollars in accordance with the requirements of its published notice and the act hereinbefore referred to.

Subsequently, on September 14, 1909, the plaintiff prepared and delivered to the defendants a bond in the specified amount, dated August 19, 1909, and conditioned among other things that, within sixty days from the date of the bond, the plaintiff would "on presentation to him enter into a contract containing such provisions and conditions as may be required by the School District and Board of Trustees thereof, etc."

The defendants refused to approve this bond for the reason affirmatively alleged in the complaint, that they "had received some information that the proposed school building could not be constructed for $26,000, and that said building would be unsafe and unfit for occupancy as a school building if built according to the plaintiff's plans and specifications, and for the further reason that said bond was dated August 19, 1909, instead of the day of delivery."

The act of April, 1872, under which the proceedings for the erection of a school building were inaugurated, provides in effect that when by any statute of this State power is given to any board to erect any public building, it shall be the duty of said board to advertise for plans and specifications, and to state in the advertisement the

amount authorized by law to be expended in the erection of the building and the premium awarded to the contractor whose plans and specifications may be adopted; and that "whenever the plans and specifications of any architect shall be adopted" the board must "before any premium shall be awarded for such plans and specifications, require such architect to execute and file with the * * * board of trustees * * * a good and sufficient bond * * * in the penal sum of five thousand dollars, to be approved by the * * * board of trustees * * * and conditioned that, within sixty days from the date of said bond, he will, upon presentation to him, enter into a contract containing such provisions and conditions as may be required by such board of trustees * * * and also conditioned that he will give such further bond to secure the faithful performance of such contract * * * in the event that such board should within said sixty days" require said architect to enter into a contract to erect the building at the price specified in the published notice.

The concluding clause of the act provides that all contracts entered into in violation of the act shall be null and void.

(2) In the case at bar but one of the enumerated essentials of the statutory contract is pleaded as having been performed, namely, the presentment and adoption of the plans and specifications. The other essential—the giving and approval of the required bond—it affirmatively appears from the allegations of the plaintiff's complaint, has never been complied with. True, a bond was presented for the approval of the defendants, but, as appears from the complaint, the condition of the bond in the material matter of time was radically different from the condition prescribed by the statute; and if, as we think, the adoption of plans and specifications was, in obedience to the requirements of the statute, conditional upon the execution and approval of the required bond, then, in the absence of such a bond, duly approved, no valid contract could be entered into by defendants with the author of such plans and specifications. If we are correct in this conclusion, it follows that the complaint does not and cannot be made to state a cause of action.

While it is true that the statute of 1872 has been suspended by legislation governing some districts, the above citation recalls to our minds that it still exists in the statutes of the State at the present time.

In the most recent official publication, sent out to School Boards by Superintendent Hyatt for their instruction in the legal method of procedure for acquiring school funds, buildings, grounds, etc., etc., the statute of 1872 appears (hitherto practically forgotten) and School Boards in certain districts can justify themselves in following no other method of procedure.

The San Francisco Chapter of the American Institute of Architects, took steps at the last legislative session to have this statute repealed, but for some reason the movement died in the judiciary and the old relic of the provincial days when architect and builder were one, is bound to manifest itself occasionally as the illustration will show, until its absolute repeal has been accomplished or more sane regulations substituted.

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* *

Sawdust Concrete Floor

Sawdust concrete was used in the new Public Library building at Springfield, Mass., as a base on which to lay cork carpet covering the floors. The object of the sawdust concrete was to obtain a layer into which nails could be driven and which at the same time would hold the nails. The company that laid it states that it accomplished both purposes. After several experiments with different mixtures it was found that a 1:2:3-4 mix, three-fourths of a part of sawdust, gave the desired result and 5,000 square feet of this mixture were laid. The thickness of the layer was one inch, and after four months of service indications are that the material is a success.—Cement Record.

The Behavior of Concrete in Structures on the San Francisco Water Front

BY C. E. GRUNSKY.*

THE docks of the Quartermaster Department of the United States Army at Fort Mason were completed about two years ago. They are of concrete throughout. Some of the inshore cylinders are encased in steel. All other cylinders have wood stave shells. Where the concrete is stripped it is hard and of good quality. No difference in quality is noticeable from above high water down to low water. There is no deterioration apparent due to the action of sea water. The concrete bulkheads show that at some points there must have been slight defects in the lagging of the forms. A few spots were found where apparently there had been some washing out of cement before it had set. Where this occurred, generally near the low water line, the concrete is somewhat pitted, and small cavities, negligible as defects, are the result. Around these the concrete is hard and firm. They are referred to merely for the purpose of noting that they are not due to the action of the bay waters upon good concrete.

The government wharves are throughout in excellent condition, and the concrete gives every promise of rendering satisfactory service. The wharves are too new to show any effect of age.

Pier No. 27—at the Foot of Lombard Street. Completed Nov. 15, 1907. Concrete cylinders supported by single piles. Caps are steel I-beams. The concrete is encased in a wooden shell of four-inch red fir. The wood is still in place, although being rapidly cut away by the limnoreae. Concrete under the wood protection could be seen at only one or two points. One spot was found where the wood was gone and the concrete was poor. At this spot there was very little cohesion between the particles of rock. Tidal currents are swift under this pier.

At the outer end of this pier ten of the concrete cylinders have failed and are missing. Seven are gone out of the ten which should be in the outer row, five are gone in the second row, and two in the third. The failure of these concrete cylinders before they were five years of age must be attributed to other causes than deleterious action of sea water upon concrete. The real causes could probably be ascertained by stripping some of the remaining cylinders and by an examination at the mud line by divers. My examination was restricted to what could be seen above the plane of lower low water.

Pier No. 25—at the Foot of Greenwich Street. This pier was completed on Nov. 5, 1907. The wooden caps of this pier rest on concrete cylinders, each of which is built around and upon a three-pile cluster.

About twelve of the concrete cylinders have failed, and others show signs of movement and failure. The concrete is encased in wooden shells, which are still in place; consequently the quality of the concrete in the piers could not be ascertained. There is no doubt, however, that here, too, the failures are to be attributed to other causes than the use of concrete in sea water.

Pier No. 23—at the Foot of Greenwich Street. Completed July 24, 1902. The concrete cylinders supporting this wharf are built around clusters of three piles. The caps are of wood. The concrete of the piers is hard, though some small parts were found where it was soft. As these spots are local, and the rest of the concrete in the same cylinders and under the same exposure to the action of the water is in good condition, the softening, if there has been any, is evidently not due solely to the action of sea water, but there must be other contributory causes. About seven of the concrete cylinders have failed entirely and are gone.

*Notes taken from a professional report by the writer.

Pier No. 19—at the Foot of Union Street. Completed January 8, 1902. The supporting cylinders are built up of three cluster piles encased in concrete. The caps are of wood. The concrete is of poor quality. The ingredients separated to a large extent in the placing, and the cement failed to perform its function. When the concrete lost the support of the wooden shell which had served as a form much of it fell to pieces. Above the low water line the pile cluster of some of the piers can be seen with a stub of concrete projecting up out of the water and another hanging down from above. A sample was taken from the cylinder at the southeast corner of the wharf which is one in the condition described. From the stub projecting slightly above the low water line a piece about 12x6x3 inches was broken off, which turned out to be no concrete at all being apparently free from sand and from broken rock. Its formation was undoubtedly due to the washing out of the cement by the water under which the concrete was deposited and the formation of the well-known substance "laitance." The sample is a soft, spongy substance which made any union between the concrete below and that above absolutely impossible. Its presence indicates that the failure of the cylinder must be ascribed to poor workmanship or improper methods of filling the wooden shell of the cylinder, and is conclusive evidence that it was not good concrete which failed.

Pier No. 9—This is Pier No. 2 at the Foot of Broadway. It was completed on April 8, 1903. There is a single pile in each concrete cylinder. The caps of the wharf are steel I-beams. The concrete was placed in wooden stave forms.

At least thirty cylinders are gone from under this pier. There is abundant evidence that here, too, the failures are attributable to other causes than the deterioration of concrete under the action of sea water. Many horizontal joints in the concrete can be seen where there is no cohesion between the lower and upper sections of the cylinders. In some cases rubbish or material other than concrete which had been allowed to accumulate on the top of the lower section has been washed out, so that the upper block hangs on the pile free from the lower one. Where, even near such defects, the concrete was originally of good quality, it is still hard. Here, as elsewhere on the water front, good concrete shows no symptoms of failure due to the action of sea water.

Pier No. 7—at the Foot of Pacific Street. This pier was completed April 6, 1896. The concrete cylinders are built around three-pile clusters. They are encased in steel shells. As the steel shells are still in place, the character of the concrete could not be ascertained. The supports of this pier, as seen from a rowboat, appear to be throughout in good condition.

Ferry Building Foundation Piers. The Ferry Building is at the foot of Market Street. Its foundation was constructed in 1894. The building rests upon concrete arches supported by large rectangular concrete piers. The inspection was from a rowboat, but was not extended to every pier. No symptoms of failure were discovered. The concrete is in firstclass condition.

Concrete Sea Wall at the Foot of Market Street. The sea wall at the foot of Market Street is a massive structure, the face of which is exposed to the water of the bay from a little above low water to high water. It is about on the front line of the Ferry Building. The same statement made for the foundation piers of the Ferry Building applies also to this sea wall.

Pier No. 10—at the Foot of Howard Street. Completed August 23, 1900. The wharf is supported by concrete cylinders built around and carried by three-pile clusters. The concrete was placed in wood-stave shells or forms, which are now for the most part gone, so that the concrete can be readily examined. The concrete is of good quality. A few spots were discovered where poor work was apparent. These were in the nature of pits of small extent in the

surface of the cylinders. The concrete around places of this character was hard. They were evidently not caused by any deteriorating action of salt water upon good concrete.

Pier No. 12—at the Foot of Folsom Street. Completed March 30, 1897. This pier is supported on concrete cylinders built in steel shells. Three or four piles were driven in each cylinder before the concrete was placed. The steel is still in place, and all the cylinders are apparently in good condition.

Piers No. 40 and No. 54. Both of these piers are on the water front southward from Market Street. No. 40 was completed in 1909, and No. 54 in 1911. The reinforced concrete cylinders of these structures carry caps of reinforced concrete. Both piers, being new, were given only a superficial inspection, and appeared, except for a slight breakage of a fender pile and a little damage to the top work of No. 54 resulting from ramming by some vessel, to be in perfect condition.

Piers Nos. 34, 36, 38, 42 and 44. These piers are also to the southward of Market Street. Nos. 42 and 44 were completed in 1906; the others in 1909 and 1910. The inshore portions of No. 36, and the others throughout, are carried on concrete cylinders. No special examination of these piers was made, as they appeared to be in perfect condition, and are not of sufficient age to prove or disprove the serviceability of concrete for water-front structures under conditions as they prevail in San Francisco.

* * *

Cost of Building Construction

WITH the single exception of San Francisco it has been said that it is more difficult to carry on building construction work in New York than in any other city in the whole United States. In the case of the former the difficulties are those imposed by labor, while in New York City the difficulties are due to complexity of building laws. In discussing this subject and that of simplifying legal building requirements a writer in a recent issue of the Record and Guide gives some rather interesting figures showing the cost per cubic foot of construction in several of the leading cities. In New York City construction is about 2 cents a cubic foot higher than in San Francisco, while in San Francisco construction costs run from 12 to 15 cents more than in other cities similarly situated with regard to the shipping and railroad facilities. As a matter of fact construction in both New York and San Francisco should be lower than in Chicago, Denver and New Orleans, yet the range of cost for average buildings in American cities is as follows:

CONSTRUCTION COSTS	Cents per cubic feet
New York (Greater)	23 to 28
San Francisco	21 to 26
Chicago	20 to 25
Boston	20 to 23
Pittsburgh	20 to 22
New Orleans	19 to 20
Oakland	18 to 21
Denver	18 to 19
New Haven	18 to 19
Philadelphia	16 to 18

From the above it is apparent that the local operator in Greater New York has to pay more for the legal requirements imposed upon his contractor than do operators in other cities, due allowance being made for the fact that union wages are higher here and in San Francisco than they are in any other city.

An Argument for Fireproof Floors and Partitions in School Buildings

Supposed Fireproof High School Building, Dewey, Oklahoma.

The Same Building After a Fire on February 4. Absence of Fireproof Floors was Responsible for the Extensive Damage. A few Thousand Dollars Spent for Concrete or Hollow Tile Fireproofing Would Have Confined the Fire to at Least One Floor, if not to a Single Room.

Architects and Their Services

MANY people who have the building bee in their bonnet but who are not quite ready to go ahead, are afraid to approach an architect and talk the house over for fear he will consider himself definitely engaged, or for fear he may charge for every word of advice given. Now, most architects are pleased to give suggestions and to make rough sketches gratis in the hope of getting the commission. But if these sketches are taken to an inferior man to be worked up or, as is not uncommon, they are given directly to some contractor to build from, the architect naturally resents such treatment and sends a bill. No fair-minded person need be afraid of visiting several architects and frankly stating to them that he came merely to talk the house over and to see some of their work. They will probably all furnish him with rough sketches with the understanding that he is not to be charged for them. In fact, many men in the profession obtain all their work in this way, not only residential but even municipal where the expense of preparing rough drawings may amount to a thousand dollars or more. Those who fail to secure the work simply put it down to profit and loss. But if the successful competitor, after making complete preliminary studies, should be told that the owner is forced to abandon his building project, he expects, nevertheless, to be remunerated for them. The usual charge for completed studies is one per cent of the estimated cost of the work, while for completed working scale drawings it is not unusual to ask one-half of the total commission that would have been paid had the work proceeded.

This brings to mind the story of a young architect who, while visiting his mother in a house he had built her, was asked by the woman owning the adjoining farm to come and look over the old farmhouse of her ancestors and suggest how it might be remodeled. He spent several mornings measuring up the house and drawing a number of schemes within her figure, $3,500. Then it occurred to her to ask what his commission would be, and on learning of the customary six per cent she felt outraged. She expected to pay $50 at the most, and if architects charged six per cent she "guessed" the local builder could do the work! and she locked up the young man's sketches in her desk. "But," she went on, "as I consider your mother a very nice neighbor and as she has promised me all the apples from the trees along the dividing fence, I would like to pay for the time you've wasted." The amused architect replied that his "wasted" time was worth $25, and left. No check came, however, but late in the fall his mother received two barrels of her own apples, valued at $5 each, and in payment, so the accompanying note read, for her son's professional services. This happened, we are sorry to add, in Connecticut.

House Beautiful.

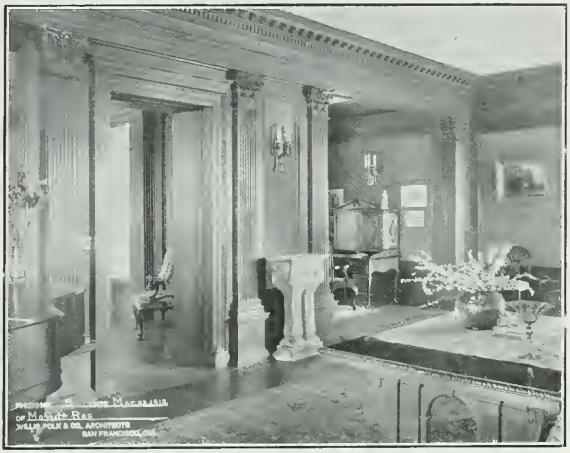
* * *

Appreciative

Frank Miles Day, the architect, desired to illustrate at the T Square Club a piece of architectural ignorance.

"Why," he said, "it was as bad as the woman who listened to a lecture on the Cologne cathedral, and at the end shook the lecturer's hand and said: 'Oh, thank you, sir, for your illuminating remarks. I have often wondered where our colonial architecture came from. Now, of course, I see it comes from Cologne.'"—Los Angeles Times.

San Francisco Gas and Electric Company's Station "D" Showing Before and After Alterations and Picturesque Treatment of Court.
Willis Polk & Co., Architects.



Interior Moffitt Residence, Oakland
Willis Polk & Co., Architects

Interior Moffitt Residence Oakland
Willis Polk & Co., Architects

Interior Moffitt Residence, Oakland. Willis Polk & Co., Architects.

Art in Stained Glass

IN Chartres Cathedral there are 175 stained glass windows which are regarded as being among the most wonderful in the world, most of them dating from the twelfth century. Scarcely one of them dates from later than the thirteenth century, and the entire collection is considered the most complete gallery of the rich mosaic glass of that period.

This is the reckoning, says "Handicraft," 124 great windows, three great roses, 35 lesser roses and 12 small ones! And in these are painted 3,889 figures, including 32 contemporary historical personages, a crowd of saints and prophets in 38 separate legends and groups of tradesmen in the costumes of their guilds.

The reds, like those at Reims, are everywhere wonderful; the saffron also and the citron yellows, the brown and the emerald green; but most superbly beautiful of all are the blues, the lucid transparent azure of the twelfth century lancets, and the deep sapphire, the blue of Poitiers, which fills the lower windows of the nave.

The secret of its manufacture is lost, but you can understand, when you behold it, how easily that story was believed which said that in order to secure this depth of blue the monkish glaziers used to grind sapphires to powder and mix them with their glass. There is only one thing that can be compared with the stained glass of the North, and that is the mosaics of the South, of Ravenna, Palermo and San Sofia.

The cathedral offers to the student of glass, a perfect model, not, indeed, of detail, for upon the path which leads to the perfection of detail the thirteenth century glazier still had many steps to take, but of effects in decorative coloring. In the rose you have a confused effect of color, in which there is not any too definite form to spoil the charm of the broken bits of color upon the senses.

But it is in the lancet windows of the nave that the row of otherwise (let it be confessed) ungainly figures supplies by means of the drapery, cloaks and borders that mixture of color and shade that makes color beautiful, and with those broad masses of stain combined with absolute simplicity and severity of design which should be the ideal of the glazier. And they are not crowded with too much story.

But though the palette of the early glazier was so rich in quality with those splendid reds and ineffable blues, the secret of which has long been lost, and other primary colors, it was poor in extent. To this poverty must be ascribed the curious coloring of many details. Beards are often painted blue and faces usually brown. Some shades of a rich purplish brown, was in fact, the ordinary flesh tint of the early glazier.

The sunburnt effect of their brown visages only accentuates the Oriental aspect of many of these glass figures. As at Bourges, so here, the influence of the East is plainly visible, not only in the hieratic type of the personages and their sumptuous apparel, but also and still more undoubtedly in the mosaic borders by which they and the medallions beneath are framed.

* * *

Sound Ceilings

No lath and plaster ceilings can be made sound and free from cracks unless the joists are well seasoned, firmly fixed and sufficiently strong to carry the overhead weight, as well as sustain the weight of the lath and plaster and resist jarring. Ceiling joists should never be more than 12 inches from center to center. Good lath, with break joints every foot and well nailed, is also imperative. If the above dimensions are exceeded the laths are liable to give or twist, on account of the weakness of the laths, or the weight of the plaster, or both combined. Where the ceiling joists are spaced wider than 12 inches, and a good job is desired, the ceiling should be strapped across the joists, which is done by fillets one and one-half to two inches wide by seven-eighths to one inch thick, and spaced to 12-inch centers. This strengthens and stiffens the joists, gives a free key for the plaster, and forms a sound, level ceiling. For lime mortar the lath should be keyed at least three-eighths of an inch, and for patent mortar no less than one-fourth inch.

* * *

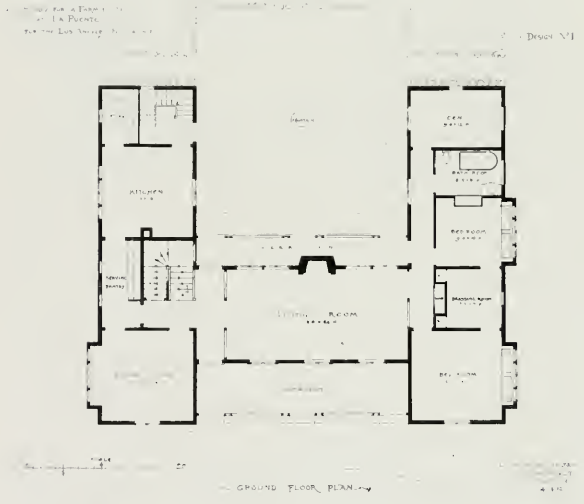
Up to Date

"That story of the building of the Tower of Babel should be modernized."

"But how would you account for the confusion of tongues?"

"Why, I suppose they had the tower pretty nearly up and then somebody yelled 'Graft!' and everybody accused everybody else and the job was held up!"—Cleveland Plain Dealer.

Suggestion for a Farm House, Los Angeles — Robert Brown, Architect

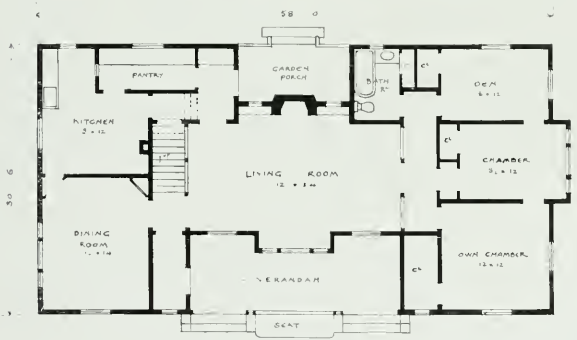


Ground Floor Plan for above Design

A STUDY FOR A FARMHOUSE
AT LA PUENTE - CAL.
FOR THE LOS ANGELES FELLOWSHIP

DESIGN N°2

ENTRANCE FRONT



GROUND FLOOR PLAN

SCALE 0 10 ft

ROBERT BROWN
ARCHITECT
BOSTON

Study for a Farm House at La Puente California *Robert Brown Archt*

Alternate Design for Farm House, La Puente

A Simple Country House in Cement Plaster Finish

THE accompanying sketches are by Robert Brown, a Boston architect, who will shortly make his residence in Southern California. In explanation of the drawings Mr. Brown writes as follows: "I have recently bought a small holding at La Puente, eighteen miles east of Los Angeles, and intend to make my future home there. I have been making studies of the house which we intend to build there, and I am sending five sheets of drawings to you in hope that you may publish these in the next issue of your paper.

"The buildings are intended to be of wood, framed in the usual way, and plastered on the outside. The first floor rooms are 8 feet 6 inches in the clear; the upper story, partly in the roof, is 8 feet in clear, the roofs covered with shingles. The interior is to be finished in the simplest manner. There are two designs for the larger house, the alternative showing two floors in the center only, the wings being one story only."

* * *

Mantels Made of Concrete

MANTELS for houses can now be made of cement. Different stones and marbles are well imitated, and antique as well as modern designs are used. As the taste of many still clings to the wood, we are glad to find that some dealers are carrying the wooden mantels all ready to place. Fine reproductions of the Colonial types are seen, even to the hand carvings which are so beautiful in the old woodwork of the fine houses. It is interesting to know that so many people are bringing the doors and mantels and cornices from the houses that are obliged to be taken down, to place in new homes. As the fireplace is the focus of the room, too much attention can hardly be given to make it attractive and beautiful. The tiles for the hearth and facings were never so varied. The oval mirror, or plaster cast, or suitable picture, above the mantel, and the bright, cheerful fire beneath make it the favorite spot around which the family gathers, and where friends come, to go, and come again.

School Room Blackboards*

By CHARLES W. CUMMINGS

IN planning the construction of the modern school building no single feature entering into the interior finish is so important as that of blackboards. Granting that other materials entering into the construction are efficient for strength and finish the "blackboard problem" is ever with the architect until experience has proven to him the most satisfactory material to include in his specifications.

The constant and severe use to which the blackboard is put in the schoolroom necessitates a material of good wearing qualities, one which will not become "slick" and "shiny," which will take chalk readily and erase easily, leaving the board clean and fresh looking.

Genuine stone slate has been considered by many architects as the most suitable and lasting material for blackboards. The writer does not agree with this view. The surface of slate is not dead black so that writing on it is not so easily visible as on composition boards. The surface is more or less porous, the pores fill with chalk dust, presenting a dirty-grey or "dead" appearance, besides producing more chalk dust. Even if washed frequently, to the detriment of surrounding mouldings and finish, the original blue-black lustre cannot be maintained. Slate can not be successfully mined and shipped in slabs longer than five or six feet, thus necessitating frequent unsightly joints. No matter how carefully the boards are set there is almost certain to be some warpage, thus throwing the edges out of true alignment.

Slate has the additional disadvantages of "noisiness" and a hard surface is never pleasant to write upon; most of us who attended school some years ago remember the clammy disagreeableness of the common desk slate, which has been practically discarded forever.

Where slate is insisted upon by the owner, however, the specifications should call for the best grade of hand-shaved Pennsylvania natural slate, uniformly 3-8 inch thick, of as long lengths as possible, perfect in color and finish and free from knots, curl, cross grain, veins, clay holes, scale or other defects; face to be gutted and pumiced to a smooth and high polished surface. Slate should be set only by experienced mechanics, the entire back of boards imbedded in cement mortar, joints cemented and scraped, flush surface, and made as nearly invisible as possible; top and bottom of boards should be brought to a straight edge.

Genuine slate of the best quality and properly set is expensive, hence the effort made by many manufacturers to produce a satisfactory material at a medium price which has the proper writing and erasing qualities, as well as durability. A few excellent blackboard materials have been evolved, one of which is termed "artificial slate." This is composed of a plaster substance, containing the right amount of "grit" such as ground emery, powdered slate and steel filings to catch the crayon and still not prevent its being erased cleanly. This material is applied directly to the hard wall plaster, which should consist of two coats of Empire, Reno, Ardin, or any good hard plaster of similar grade, and should be on 28A. gauge herringbone expanded steel lath or 24 gauge Diamond Mesh. This blackboard should be applied over metal lath only as wood lath has a tendency to swelling and shrinkage which may affect the surface of the board.

The success of "Artificial Slate" depends upon its proper installation, and specifications should therefore provide that it be installed only by the manufacturers or their accredited representatives, and should be guaran-

*Further discussion of this interesting subject is invited.

teed by them against faulty workmanship and material. Experience has proven that when properly installed it makes an excellent blackboard at a cost of about thirty-five per cent. cheaper than stone slate.

The best and most satisfactory of the composition blackboards is a product of wood pulp called "Hyloplate." It is made in long slabs about one-quarter inch thick, thoroughly dried to prevent warping, and provided with a blackboard surface applied by machinery of a composition known only to the manufacturers. Its surface seems to take the chalk readily and erase easily and if chalk of the proper grade is used the surface of the board will wear a great many years, after which it is possible to renew the surface with slating and add many more years to its life. When put up by the manufacturers it is customary for them to guarantee it for a period of ten years; there are many instances, however, where it has been in constant use for from fifteen to twenty years.

The only proper method to put up Hyloplate Blackboards in a first-class building is to provide in the specifications that it be installed only by the manufacturers, and glued to a wood backing, which should be seven-eighths inch pine, thoroughly kiln-dried, V and Center V or T and G, nailed on studding. In the case of outside brick walls, furring strips should be inserted at top and bottom lines of blackboard to which the wood backing may be nailed, leaving an air space of one-half inch between brick and wood on account of the danger of absorption of moisture from the brick walls. On concrete walls the same furring strips should be inserted in the concrete and if vertical strips two inches wide and surfaced are also placed flush in the wall on twelve inch centers it will be possible to dispense with the solid wood backing.

Hyloplate is made in both black and green color; the latter is popular as a change from the funereal dead black and the fact that it lends itself more readily to the scheme of decoration in a school room and improves the general appearance of the walls. Hyloplate seems to be moderate in price, being about one-third less than stone slate, and in most cases it has given good satisfaction to the users.

* * *

Cracked Plaster Work

Cracks in plaster work are due to various causes. They may act individually or in combination. Cracks are often caused by settlement of the building. These cracks may be easily discerned by their breadth, depth and length. They also arise from the shrinkage of bad or unseasoned lumber used in the construction or framing of the building, which may cause displacement in the joists or lath. Other causes are the too sudden drying of the work; strong winds or heat; the laying of one coat of mortar on another coat before the first has sufficiently dried, or on walls that have a strong suction, which absorbs the moisture or "life" of the coat being laid, when it becomes short, or crumbly, scaly and apt to peel or fall off. In this last case it does not set, but only dries and shrinks, which gives rise to cracks, and eventually falls or crumbles away. The use of bad materials, insufficient use of lime and hair, or skimping of labor is often followed by cracks. Insufficient labor and unskilled workmanship in the application of the materials is a great source of trouble; but it will be understood that the best quality of labor will not make bad materials good and strong; and, on the other hand, the best materials will not compensate for bad labor. It is only by judicious selection of materials, and their skilled manipulation, that a high and enduring class of work can be obtained.—Rock Products.

Why Engineers Should Make Good Mayors

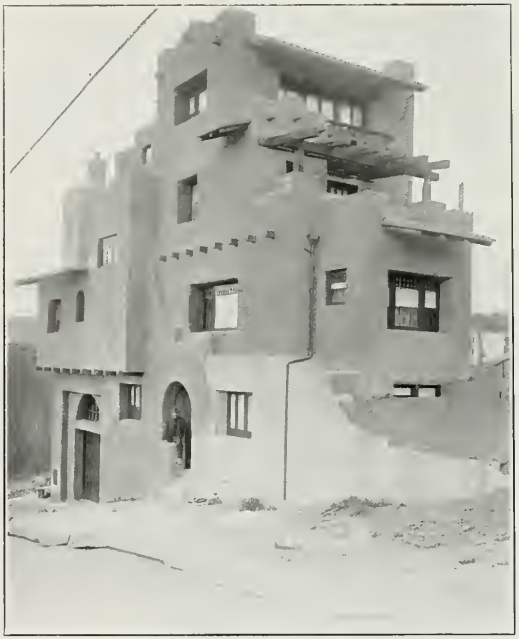
THE election of Mr. George F. Cotterill, mayor of Seattle, Wash., suggests the special fitness of experienced municipal engineers to serve as mayors of cities, says Engineering-Contracting. Since a very high percentage of the business transacted by a city is handled by the public works department or, in the case of new construction work other than the natural extensions to existing works, is handled by commissions appointed for that purpose, the value to the city of a mayor with experience in engineering enterprises is apparent.

In the case of Mr. Cotterill it so happens that he was not chosen mayor on account of his engineering knowledge, but it is evident that, other things being equal, his experience as an engineer will make him a more competent executive than a lawyer, business man, or politician could hope to become, even when actuated by the high motives characteristic of the engineer. Mr. Cotterill has been in the engineering department of the city of Seattle for the past eight years and consequently is thoroughly in touch with all the needs of the city.

We have mentioned lawyers, business men, and politicians because mayors usually are chosen from those classes. It probably will be conceded that an engineer is better fitted to cope with the public works problems of a city than are the others mentioned, but on certain other questions these others may be held by some to possess advantages over the engineer. Naturally the lawyer is more skilled in the legal wording of ordinances and contracts, but the lawyer mayor is governed not less in such matters by the rulings of the city's legal department than is the engineer mayor. The business man, as the term is understood, does not possess a single advantage over the modern engineer, who is a very capable business man himself. We dislike to weigh even single qualifications of the politician against those of the engineer yet this will be done by voters and newspapers when the choice between these types is offered. The politician has only one advantage and that is his ability to handle the various factions of the city council. However, the whole tendency of present day municipal reform is operating to make this latter consideration of decreasing weight. Moreover, no citizen is better qualified than the engineer to lead the voters in renovating the old-fashioned city council. On all questions of a general nature engineers are at least as well qualified as other men are to advise and lead the city council.

Those who are familiar with the work of the Chicago Commission on City Expenditures may recall that the experts employed by the commission estimated that $227,500 was wasted in the year of 1909 in the sewer and catch basin cleaning department. Another point brought out was the loss of $150,000 to the city in street repair contracts. Our readers will remember recent articles and editorials relating to the Chicago water works system which pointed out, among other things, that two-thirds of all the water pumped in the city pumping stations is lost by leakage and waste. All these matters have adversely affected the citizens of Chicago. In spite of the fact that the engineering department of the city repeatedly called attention to these and similar conditions, former mayors and councils failed to take any action on such matters. We do not doubt that an engineer mayor would have instituted reforms in these matters as soon as they were brought to his attention.

City engineers often are unable to design and build public works according to their best judgment on account of interference with their plans by officious mayors and aldermen. This condition is responsible for much of the so-called poor municipal engineering in this and other countries. The remedy for this malady, in some cases at least, is the election of an engineer to the office of mayor. Wherever this condition exists no one need doubt that a well qualified municipal engineer would make a strong candidate for the office.



House for Mrs. Margaret Ward, San Francisco
Charles F. Whitlesey, Architect

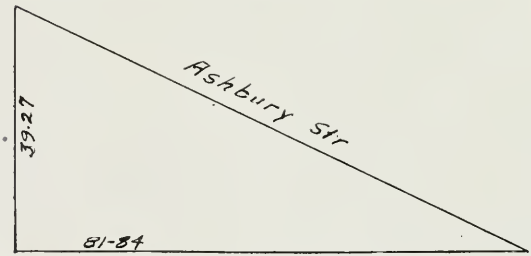


Diagram of Three Corner Lot, upon which the Ward House is Built

The Possibilities of a Narrow Three-Corner City Lot

A STRIKING example of what may be accomplished with a narrow three-corner lot is found in an attractive city residence that has recently been completed for Mrs. Margaret Ward, on the corner of Clayton and Ashbury streets, in San Francisco. The owner had the advantage of an 81 foot frontage on each street and made the most of it by utilizing every inch of ground, obtaining really remarkable results.

The exterior of the house is cement plaster on metal lath. The house has deep recessed windows, giving a very heavy, substantial appearance. The space under each window is made into a music cabinet, or book case with leaded glass which not only adds greatly to the beauty of the interior but makes splendid use of otherwise waste space.

The large living room, 30 feet long and 18 feet wide, occupies almost all of the space at the sharp point shown in the diagram. A den, 10 feet wide at the extreme end, is one of the interesting parts of the room. On one side of the living room is an opening six feet wide and twelve feet long which has a large open fire place built of sandstone and takes up the entire length.

The head beams, the paneling three feet wide and three feet high, with the woodwork stained a rich brown, the imported wall covering in shades of burnt brown and gold, together with the hardwood floor, make a very rich and harmonious color scheme.

Craftsman furniture is used in this room and it blends perfectly with the woodwork. The dining room is 16 feet by 18 feet and with the hall has beamed ceilings and hardwood floors. The dining room is panelled 6 feet high and has gold embossed wall paper. There is a Dutch tile mantel and open fire place in this room. The sleeping chambers are on the second floor. All of the woodwork in these rooms is white. The walls are papered in light colors.

The Architect from the Standpoint of the Builder*

JOHN A. KELLEY

AS a class and individually, the architect is preyed upon and succors more parasites than any other profession that I know of, and yet these dependents are necessary, in a way. An architect who turns his face from the newspaper man, who refuses to see the material man, who is not at home to the manufacturers' agent or the man with the mechanical device is treading the downward path. The architect who puts a sign on his door "No Agents Allowed" is sounding his own funeral march. This is borne out by the history of the profession, everywhere. It is certainly a fact that the attitude of the building industry toward an architect marks his standing in the community in which he operates.

I would not be here tonight, perhaps, had it not been for an unfortunate instance of a few weeks ago when one of the members of our Exchange endeavored to make us shoulder a burden that we did not desire to carry. It was in regard to your universal specification cover and it was charged that the Exchange was against the cover because some of its members had grievances against the architects. This proved to be entirely unwarranted in fact and was disproved in the presence of your committee.

The Builders' and Traders' Exchange of Columbus has no grievance against the Columbus Society of Architects. There are, no doubt, members of your society who do not get out sufficient details, or whose specifications are indefinite, or who require too many alternate bids or whose general conditions are too stringent. These are matters to be taken up with the individual architects in question, either by a committee from the Exchange or by the individuals who figure out of these offices. The Exchange has, however, appointed an Architects' Conference Committee which may bring before you at a later date some matters pertaining to the general conduct of business or general practice in the relationship of the architect and builder.

While I am secretary of the Builders' Exchange it shall be as it has been in the past, my earnest desire to cement the bond between the architect and the builder and to bring about a closer and more friendly relationship between the organizations. The conditions in Columbus, in my opinion, are better than in any other city in the country. In no other city is the relationship so general. It is certainly gratifying to know that every one of you uses the plan room of the Exchange to secure bids and that there is not one of you who does not send his plans to the Exchange for figures. This indicates, as nothing else could, the highly developed good feeling and respect for each other's ability that is as unique in the building world as it is remarkable. The Columbus Exchange is envied by all similar organizations of the country from this very fact.

Of course, there are contractors who do not figure in the offices of certain architects just as there are architects who do not care for figures from certain contractors, and so on. But these cases are so rare that to me, as a man between and watching both sides from the inside, it is marvelous, especially considering how many differences will arise in connection with the construction of a building. Some contractor believes that he has been worsted or some architect believes that a contractor has worsted him, and there will be such cases as long as there is a world.

The architect cannot serve two masters. He cannot serve the owner and the contractor. The contractor knows that often the action of the architect in letting contracts is influenced by the owner. It is primarily the architect's business to look after the interests of the owner. Thus, he has autocratic power. The contractor is, figuratively speaking, "under the architect's thumb." The contractor must look to the architect and no matter how much he is imposed

*Extracts from speech made by John A. Kelley, Secretary of Columbus Builders' Exchange, before Columbus Society of Architects, March 11, 1912.

upon, he has no redress. If he appeals to the owner, or goes over the head of the architect, he gets in bad. If you were a contractor in Columbus where there are not more than thirty or forty architects, you would hesitate a long time before causing a rupture between yourself and one of the architects. Every time a contractor gets in bad with an architect, he cuts off a slice of his opportunity for income.

There are many cases happening every day where a contractor goes into his own pocket to avoid trouble with the architect; that is, in supplying something that the architect has left out or in righting some mistake or other. The contractor must knuckle to the architect if he expects to continue to do business in the same community, the contractors tell me.

The point I desire to make is to impress you with the full realization of your autocratic power. This power, I believe, should make you the more lenient with the contractor. There must always be unexpected difficulties arise in the erection of buildings, be they large or small, owing to the peculiar working conditions of the industry.

Your plans are sometimes prepared in a hurry and the contractors are compelled to figure in a hurry, and no wonder trouble arises. You have everything to contend with, even the weather, and the contractor has everything to contend with that you have, and also he has you to contend with.

A recent instance indicates your power over the fortunes of a contractor, and it happened right here in Columbus. One of the members of a contracting firm called an architect who was superintending a building, a nasty name. Perhaps it was in an argument in which the superintending architect thought the contractor was not following the specifications. The architect ordered him off the job, which was proper. But he went further and ordered that no member of that contracting firm should come on the job. "I'll make it cost them $5,000," the architect boasted. And he did. He deliberately took revenge, using all the advantages of his power. This is a flagrant case and the contractor was in a position that he could not strike back.

I speak of these things that you may know how often a contractor grins and bears and you hear little of it. I am speaking on behalf of the contractor and I am glad to state that there are few instances of this kind on record in the city. The contractors here are proud of you as business getters and proud of your capabilities and as a rule you are fair with the contractor. Otherwise, the relationship here would not be so good. But we urge that you be careful of your power and remember that the best of contractors, as a rule, are men struggling without much capital, courting failure and gambling with fortune. With everything against them and with everything to contend with, including the weather and the railroads.

The contracting business is a gamble pure and simple. The contractor gambles for the job, and landing it, he gambles that his subcontractors will do their part; gambles that the materials are suitable and that they will arrive on time; gambles on the specifications of the architects, if they are not clear; gambles against the weather and time and labor troubles and sometimes gambles on getting his money.

The architect should give the contractor credit for knowing him (the architect). You are few and you are in the lime light all the time. Each one of you are discussed daily at the Builders' Exchange. If your general conditions are too strong, all the contractors know it, whether they figure in your office or not. If your details are lacking, it soon gets around, from the mill man to the general contractor, and so on through the trade. If your specifications are not clear, the contractors talk it over and everybody knows the state of affairs. If you make a practice of giving the contractor small consideration and forcing him to the limit, it becomes a by-word in the trade.

Every one of you is listed and labeled in the minds of the contractors. They know your history from the beginning. They know just what you did to this contractor on that job and they even know the exact details of how you get your work, or what influences you have behind you. In fact, there is nothing about you that we do not learn, even the minute details in your offices. We have numerous sources of information and you are few, and you are on exhibition all the time. We know when somebody is low on a job and you do not want him to have it. We do not tell you these things, but we know them. Therefore, I believe that you should be perfectly frank with the building industry because it is to your best interests to do so. In so far as I am concerned I find that most of you are frank with me and it is highly appreciated.

You would be surprised to know how conditions in your offices or inherent in yourselves affect the prices of buildings you design and the class and number of contractors who figure on them. There can be nothing as false as the accusation that the contractors are banded together so closely that they fix prices among themselves. Human nature does not permit of such a condition in the contracting trade, as yet, at least. There are 200 contractors in the Exchange and it is a sure thing that there is not enough work to be divided equally among them. The talk of trusts and combinations is a lot of tommy-rot and nobody knows it better than you architects, whose clients profit by the fierce competition that wages in Columbus.

However, contractors are influenced unconsciously, perhaps, by association. If an architect has the reputation of bringing in troublesome details that are not in the original plans, this situation gets into the pencil points of the contractors and they naturally add something to get on the safe side. Eventually, such practices on the part of the architect causes him to lose the estimates of the most reliable contractors and the best interests of neither himself nor the owner is served.

If your specifications read anything like this, how can you expect a contractor to figure on your work, or if he does, how can you expect the right kind of a price? "The plans are intended to call for a completed building and no extras to make it complete will be allowed, but the contractor must supply them, even though they are not expressly called for or shown." The contractor gets that far in those specifications and if he has any sense he lays down and quits right there.

If your specifications are mixed up and the plumbing specifications call for the doing of brick work like one of recent origin, providing that the enameled brick wainscoting should be done by the plumber, how can you expect to avoid difficulties? The brick man does not read the plumbing specifications in order to take off the brick work. In a recent plan floor sleepers were called for which required under-filling. The plans also showed a section of the floor raised six inches above the floor. There were no specifications for cinder filling. Will you compel the contractor to fill with cinders when it is not in the specifications?

One of the latest impositions that is found generally in your specifications is as follows: You design the reinforced concrete work, you designate the size of floor slabs and the materials and the mix and you designate the size and placement of the reinforcing. Then you ask the contractor to test out the floor for an assumed load, and in case of failure, to stand the expense of failure and all damage to the work. Is it right, I ask you? Why don't you stand back of your design instead of placing the burden on the contractor?

Along these lines I want to say a word at the instance of the contractors in regard to your superintendents. We appeal to you to be more careful in the selection of your superintendents and not to give them such unquestioned power. You take a young engineer out of college and place him over practical builders who have been in the contracting business all their lives. This young superintendent has read in books and heard professors lecture on how to handle

the contractors and he has strong views of a lot of things that he knows absolutely nothing about. We know of young men superintending your work in some instances who have instructions to use their own judgment and "don't bother us any more than you have to," and it is under these inexperienced youngsters that the contractor battles with the work and fights for his rights. We ask that you do not put too much dependence in your superintendents who are not thoroughly experienced.

The reputation of an architect, I believe you will admit, rests largely with the building interests in the community. Parties who expect to build are influenced by the opinion of material men, or contractors, etc. They usually talk with a contractor before selecting an architect. The slightest word against an architect is sufficient. A good word also goes a long way. The contractors in Columbus are loyal to the architect. Time and again we have urged an owner to have his plans drawn up by an architect. Our contractors will not figure plans that are not drawn by an experienced architect. We are boosting your game all the time and naturally because we are dependent upon you, in a way.

One of the greatest enemies of the architect and the legitimate contractor is the cheap speculative builder who makes his own plans and constructs his own cheap buildings. A city is as sound as it is builded well, and if we continue to permit the erection of these buildings we shall all suffer. The public should be taught to be wary of these builders. Most of the residence work in Columbus is being done by them today. They use material that you would condemn at first glance. In fact, they hunt up material that you condemn so as to get it cheap. They never think of architecture. The districts in which they operate are ruined forever. They deliberately violate the building laws and the building department is not equipped to inspect their work. There are some good speculative builders, but they are scarce.

Personally, the architect cannot advertise. It is unethical. But as a society you may promulgate information and do it in a manner that will bring you commendation. Eventually I believe that such organizations as yours will have a permanent, paid secretary to act in a way as your press agent. This is essentially a day of advertising and it often makes me wish I were one of you to see how you neglect your opportunities in this line. If I were in your place and designed as many pretty homes and as many substantial buildings as you do, I would get all kinds of clean, legitimate advertising from it. I would take pictures of all these buildings, inside and out, and I would give them to local papers and to magazines devoted to the building trades. The press is only too glad to get them, but the press has not the time to get the photographs and descriptions themselves. Such matters are called "features" and the newspaper must necessarily spend most of its time in collecting live news. Features are necessary to a paper, however. You may, by seizing your opportunities, get thousands of dollars worth of advertising in a year free of cost, except for that of the pictures.

As a society you could hire a photographer who would give special rates to your members. No matter what are your ethics, you must admit the value of advertising. Even the doctors do. Have you ever noticed how all strange operations get into the papers, or how even the best of physicians and surgeons use the papers? They do it deftly, and with profit.

Your organization should use the Builders' Exchange and make it more useful to yourselves. The Exchange is here and has been for 20 years and will be for 20 years longer. Through the Exchange you save yourselves lots of valuable time. You should give out all your information through the Exchange and educate the building industry to look to the Exchange for their information instead of bothering you. Keep the Exchange in mind and it will save you much bother.

As to the bids, why not give them out, if the owner does not object—at least to the contractor on the job; it is no more than right. The contractor who spends his time and labor in figuring a building should be repaid at least that much. It creates a better feeling. It brings more bids. It gives the architect a reputation for fair dealing. I am glad that most of you give out the bids and the results of your lettings. A few of you do not, and I am sure that it will ultimately result to your disadvantage if it is not already doing so.

Another thing, we cannot protest too strongly against the outside contractor coming into Columbus and carrying off some of our larger work. Some of our contractors go out of the city for work, but it is when the local contractors in those towns are not equipped to handle it. We have contractors in Columbus who have constructed and can continue to construct the largest and finest buildings you may design. Although these large contracting firms who come into Columbus have big organizations and strong buying power, they do not and can not serve your interests like a local contractor.

Instead of encouraging outside companies to figure on local work, it should be the duty of the local architect to discourage them. Outside contractors are in Columbus today and gone tomorrow. What do they care for your good will? What do they care for the interests of your client? What reputation have they to lose? They do not try to serve you as the local contractor does, for the local contractor expects to continue to do business with you and possibly your client. Instances of the lack of responsibility on the part of these out-of-town contracting firms is shown in their work here in Columbus. Some of it I am sure that no local contractor could get away with, and most of it no local contractor would have the nerve to put up. The owner, I say, does not get value received, nor is the architect's reputation upheld by these contracting firms.

Concluding, Mr. Kelley urged that the architect set a certain hour to receive material men and agents. He said that both the architect and the material men would get better results if there was a certain hour in which both would be free to talk to each other. He asked for co-operation of the Exchange and the architects in all matters relating to the welfare of the city. He declared that the builders and architects should have recognition in the appointments in the department of buildings; he suggested a joint committee from the Exchange and the Architects' Society to act as an "advisory committee" in the drafting of the new reinforced concrete code of Columbus; he urged that the new housing code be protected; that the public be educated to better public buildings; that the architects and builders redouble their efforts to push forward the civic center and park and boulevard schemes.

* * *

Underground Concrete Hospitals

NOWHERE is first aid to the injured of more importance than in the mines of Pennsylvania, for men to whom danger is an every-day reality become surprisingly careless. Formerly injured miners were forced to lie for hours in hot, stuffy ambulances while they were bounced over rough mountain roads, but modern humanitarianism has brought about greatly changed conditions. Now several of the companies in the vicinity of Shamokin, in the heart of the coal region, have installed emergency hospitals, some of them one thousand feet under ground. Probably they are the most unique hospitals in the world, and they are built of solid concrete. It would be a difficult matter to make these emergency hospitals as convenient, sanitary and serviceable as they are without concrete to use. As it is, they are very white and clean-looking. They are practically impervious to sound and could withstand a tremendous shock should there be an explosion even near by.

The space for each hospital is blasted out of the solid rock. The walls are thick and the entrance is protected by a great iron door which opens inward.

When the walls are made, cabinets are formed in the walls for holding whatever may be needed for immediate use in the way of bandages and dressings. During the construction of the hospitals the walls are pierced with iron pipes for conveying hot and cold water, and holes are also made for electric light wires, as electricity is used for lighting the rooms. In addition to these conveniences of water and light, there is a supply of pure air constantly being pumped into the hospitals when they are in use, the pumps being, of course, at the top of the shafts.

The furnishings of the hospitals generally include a couch, dressing chair and stretcher and each is supplied with a metallic first-aid case. It is not considered feasible to keep a surgeon always on duty and so the miners themselves are formed into first-aid corps and thoroughly drilled by competent surgeons. Some of the mines have these emergency hospitals at each level, with another at the mouth of the mine.

* * *

Cost Keeping for Contractors

A RECENT issue of the Journal of the American Society of Engineering Contractors contains an article entitled "Cost Keeping and Its Value in Relation to Estimating on New Work," which is significant in its substance as well as its title in that it indicates that the contractor of today is looking upon his business as not merely that of a good "boss," getting a maximum amount of work out of each laborer at the minimum wage, but that he is advancing it to be a profession, the laws of which should be studied and mastered if success is to be attained.

Even more significant of this than the paper itself was the discussion, in which several contractors stated their belief in this idea of contracting. One contractor whose work is largely reinforced concrete stated: "I keep a clerk on all of my work, and he has nothing to do but one thing, keep the time and keep track of the materials and their disposition. He checks up the materials, and that relieves the foreman of that duty. * * * It is a small job that does not pay for the clerk to keep time and check materials. I think that is as necessary as any other part of the work. If there is a bag of cement that goes over to a certain footing it is charged to that footing, and so on for other sections of the work. And all it costs to know that is the salary of the man who is taking notes of them."

Another speaker summed up the advantages to contractors of cost keeping as follows: "The old-fashioned contractor who did not keep cost records never knew whether he had made or lost money on his job until is was completed; and if he had made money he did not know on what items he had made it. He had made money on the whole job, and that is all he knew. And he used those same figures on the next job, if it was similar to the previous one; whereas, if he had kept a cost system he would have been able to bid more intelligently on work by reducing the price on some of the items where he had made more money than was necessary, and increasing the price for those items on which he had figured too low before."

The author of the article, Berton M. Laughead, described in brief what is included in such cost keeping as follows: "In order to successfully make estimates that will enable a contractor to make safe bids, it is absolutely necessary that he keep daily records, in detail, of every branch of his work, so that on completion, he will be able from such records to compile a final cost sheet that will show him the total cost and the cost per yard of his work."

Architectural Lighting Fixtures — Where Science and Art in Illumination Meet

ARE lighting fixtures a part of the building, or articles of furniture? This question has been often asked, and can probably only be satisfactorily answered for each particular case. Undoubtedly lighting fixtures may be treated in either sense, but there would seem to be a general line of division between the two cases. If the interior is large enough to display the architectural motives of the building, then the fixtures may be properly treated architecturally; in all other cases the fixture may safely be considered a part of the furnishing. Auditoriums of all kinds and other rooms intended for large gatherings, as ballrooms and banquet halls, clearly belong to the former class. Where lighting fixtures are to be shown at all in such cases they must be of sufficient proportions to avoid appearing trifling and inadequate to their purpose on the one hand and of giving an appearance of useless weight and massiveness on the other; in a word, the sense of proportion must be verynicely kept.

Fig. 1

Fig. 2

Indirect lighting lends itself particularly well to such architectural treatment. The light-sources themselves being hidden, their relatively small proportions do not complicate the problem, while the single covering which conceals the units may be made of sufficient dimensions to afford an opportunity for architectural decoration. Fixtures of this sort are shown in Fig. 1. They are made of a special composition, which secures a minimum weight with maximum strength, which can be formed in molds, thus permitting exact and comparatively inexpensive duplication. The material may be finished by electro-plating, so as to give it the appearance of bronze or any other metal; or it may be treated to represent sculptured marble or other similar material. Such fixtures possess the size and massiveness requisite to harmonize with the structural features of an interior, and as they seem to be simply overflowing with light, do not suggest the absurdity of an enormous weight of metal used to support an insignificant weight of lighting apparatus. Furthermore, the fixture being one piece, the exposed surface is large enough to receive a broad, bold decorative treatment, which is essential in an object necessarily

Fig. 3.

seen at a considerable distance.

Fig. 2 shows a smaller fixture of the same type, which would be well adapted to use in corridors, halls and smaller rooms.

Fig. 3 shows a fixture modified by the addition of direct lighting units. The opaque bowl in this case is replaced with an art glass dome, which may be used for semi-direct lighting, while direct lighting is provided for by the pendant lamps. This fixture is of such character and dimensions as to adapt it admirably to residence use. It would be an exceedingly handsome fixture for a music room or parlor, where the decorations were of such a character as to harmonize. An additional decorative feature is the color effect produced by the shades on the pendant lamps.

Fig. 4 is a fixture designed to harmonize with the distinctly new school of architecture, which is exemplified in the work of Louis H. Sullivan and Frank Lloyd Wright. While their architecture has become familiar in the vicinity of our western metropolis, and has attracted very marked comment in Europe, it has made practically no headway in the East. The fixture would also be suitable for rooms furnished and decorated after the arts and crafts manner.

In all of the examples shown there is an entire absence of the old chandelier idea of construction, and a frank effort to utilize the enormous practical advantages which the electric light possesses over the old-time sources. There is no imitation either in the form of the light or the manner of its use. The tendency to conceal modern light-sources is unquestionably growing, and is destined to dominate the general methods of illumination in the not distant future.—From the Illuminating Engineer.

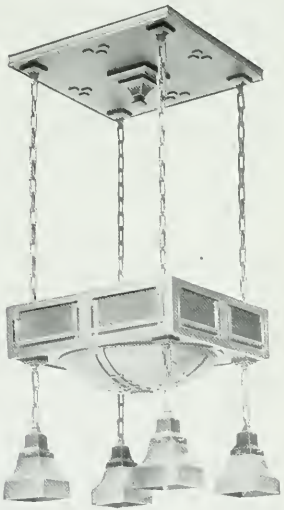


Fig. 4

With the Contractors

Mayor Rolph Wants to Know

BY WM. E. HAGUE.
Secretary of General Contractors' Association, San Francisco.

ON the evening of April 10th, in the chambers of the Board of Supervisors, His Honor, Mayor James Rolph, Jr., held a public hearing to ascertain, if possible, from the contractors the reasons for the delays which have occurred in the past in erecting public buildings for the city and county of San Francisco.

About one hundred specialty contractors were present, who presented to the Mayor the specialty contractors' side of the controversy as to the cause of delays in the past in the erection of city buildings. There were also present a number of general contractors, representing the General Contractors' Association, who presented their views as to the cause of delays.

The Mayor stated he was not satisfied with the manner in which work on city contracts had progressed in the past, that he was determined to get to the bottom of the matter as to the cause of the delays, that it was his desire to have the city work proceed as rapidly as possible and to do justice to all the contractors bidding on it. At the same time he pointed out that the delays which had occurred in the past would not be allowed under his administration, if there was any possible way of avoiding same.

A number of the Board of Supervisors were present, more particularly the Building Committee, also the three members of the Board of Public Works. The Mayor announced that he would be pleased to hear from any contractors present who desired to express their opinion on the subject as to the causes of delays.

Mr. J. J. Phillips acted as Chairman of the Specialty Contractors Committee, and he and several other specialty contractors addressed the meeting, and expressed the opinion that the blame was largely to be laid upon the City Architect's office and the number of changes in the architects which the city has employed during the last three years. In presenting this reason for the delay the specialty contractors argued that this was an age of specialization, and that the work should therefore be segregated, pointing out that some of the architects had in the past segregated private work. Mr. Phillips in presenting the views of the specialty contractors quoted the case of the temporary city hall in which the meeting was being held, and stated that the building had been erected at a cost of some $400,000, and that over thirty contracts had been let on the work. He expressed the opinion that the work had progressed to completion satisfactorily, and stated that Messrs. Wright, Rushforth & Cahill, the architects for the work, would no doubt be pleased to testify as to the efficiency of erecting a building under segregated contracts.

Mr. G. A. Wright, of the firm of Wright, Rushforth & Cahill, the architects in question, being called on later to give the Mayor the benefit of the experience of his firm in awarding segregated contracts on that particular job, stated that if he were letting the contract again he would strongly recommend the owners to award one contract for the entire building, or, at most, not more than three contracts. For the Mayor's information Mr. Wright expressed the opinion that the city would get better results by awarding one contract on a

building of $100,000 or $200,000, and stated that in the case of the New City Hall, which would probably cost $4,500,000, it was his opinion that the work should be let in not more than five or six contracts.

Mr. Chas. A. Day, President of the General Contractors' Association, Mr. A. H. Bergstrom, of the firm of Lange & Bergstrom, Mr. James B. McSheehy, of the firm of McSheehy Bros, Mr. F. H. Masow, of the firm of Masow & Morrison, Mr. Chas. Wright and Mr. F. C. Caldwell presented the views of the general contractors as to the causes of delays in completing city work, and pointed out that up to the present time the city had segregated all of its contracts, more or less; also that where the contracts had only been segregated into three or four contracts, the work had progressed much better than in the cases where a large number of contracts had been let.

The case of the Hall of Justice was taken as an instance where there had been too much segregation of work, and it was pointed out that the delays on this building were largely owing to the controversies arising between the various contractors, also that there was still some $5000.00 worth of work to be done on that building and no contractor willing to do it, each claiming that the other should do certain parts of the work still to be completed. The case of the City and County Hospital was also mentioned as an illustration of the results obtained by segregating the work on a building into numerous contracts. It developed that over sixty contracts had been let on this work to date, that the time of completion was still very doubtful and that there would probably be a number more contracts to be let on the work before it would be completed.

Mr. James B. McSheehy was called upon to give the Mayor the benefit of his experiences with the city, and illustrated with the case which he had of a contract for mill work on a certain building. In that particular case Mr. McSheehy informed the Mayor that there was a separate contract for the sheet metal work, including the metal sashes for the windows, and a separate contract for the glass. The architect's office saw fit to change the glass from sheet glass to plate glass, thereby increasing the requisite weight of the window weights from forty pounds to eighty pounds. As Mr. McSheehy in building the window boxes according to the plans and specifications of the City Architect's office did not allow space for such a heavy weight, the work was tied up pending decision of the controversy thus brought about. Had one contract been let for all three parts of the window the general contractor would have been notified of the change in time, and could have made the proper provision when putting in the mill work. This served as a rather good illustration of the difficulties arising from segregation.

It was also pointed out by the general contractors that when the work was segregated it frequently happened that the specialty contractor would not begin his particular work until the entire building was ready for him to proceed. This point was illustrated particularly with the case of a segregated plastering contract, and it was pointed out that if a general contractor had the plastering in his contract he would arrange with his plastering contractor to begin work as soon as one or two floors were ready for the lathing, and thus, as the building progressed to completion, the plastering would progress in conformity with the rest of the building. It was pointed out that where a separate contract for plastering is let the plastering contractor waits until the whole building is ready for him to begin work, and the rest of the contractors are obliged to wait until the plasterer has done his work before proceeding with the mill work, etc., etc.

The explanations thus presented to the Mayor as to the causes of delay seemed to convince him that the city would undoubtedly get better results by letting contracts as a whole whenever possible.

The argument of the specialty contractors that this is an age of specialization, and therefore should be one of segregation, can hardly hold water in the

Hotel for Mr. Mortimer Fleishhacker, San Francisco
Frederick H. Meyer, Architect.

minds of men who give the situation the necessary unbiased investigation. While it is undoubtedly a fact that this is an age of specialization, it must be clear to all that specialization does not by any means mean segregation, so far as contracts on buildings are concerned The general contractor who is awarded the entire contract for a building does not himself attempt to do all the work on that building, but sublets the different lines to the different specialty contractors who are engaged in those particular lines. The point is, that where a general contract is let there is one head to the work—one man with whom the specialty contractors and the architect is to deal, and the situation is thereby simplified. It should certainly be easier for the city to select one responsible general contractor than to select twenty different specialty contractors for their responsibility and efficiency.

To any fairminded man the arguments brought out at the meeting as to the causes of the delays in erecting public buildings in this city, must have made it very clear that the city would be benefited by awarding any ordinary contract in one general contract. The architect who is segregating his work may do well to bear in mind this fact: that in letting segregated contracts on a building he practically makes of himself a general contractor, and is placing himself in competition with the builder. The two ends of the work should be distinct and clearly defined. An architect is not a builder, and a builder who seeks to be the architect for the owner is equally trespassing on the ground of the architects. While the latter may seek to obtain from the owner an extra percentage on the work for the necessary cost of supervision, etc., he is trespassing on the ground which rightfully belongs to the general contractor, who is the legitimate superintendent for the work on the building, and therefore legitimately entitled to a percentage on the work. It may properly be said in justice to all parties, that the architect who draws the plans and specifications for a building and lets the contract as a whole is fulfilling the duties of an architect in every sense of the word.

Requiescat En Pace

THE following California corporations engaged in construction, building material and kindred lines have had their charters forfeited for non-payment of taxes and are advised by proclamation of Governor Johnson that they can no longer do business in this State:

Aiken Reinforced Concrete Co.; Atchinson Mill, Inc. (The); Alameda Construction Co.; American Process Turpentine Co.; American Paint & Dry Color Co.; Antill Patent Window Co.; Apollo Artificial Stone Co.; Arrowhead Lime Co.; Artistic Hardware & Fixture Co.; Atlas Stone Co., Inc.; Automatic Oil Burner Co.; Automatic Disappearing Bed Co.; Bakersfield Milling and Moulding Co.; Bay Cities Electric Co.; Bay Cities Lumber Co.; Bay Point Construction Co.; Bexhill Window Casement Co.; Borden Billings Concrete Culvert Mfg. Co.; Buckeye Construction Co.; Burrell Bridge & Construction Co.; California Builder's Supply Co.; California Engineers' Supply Co.; California Insulating Varnish & Paint Co.; California Pole & Piling Co.; California Plumbing Supply Co.; California Roofing and Supply Co.; California Tile & Terra Cotta Co.; California Wood Fibre Plaster Co.; Carquinez Electric Construction Co.; Carterra Contracting Co.; Century Electric Co. of Alameda Co.; Central Construction Co.; C F Fisher Plumbing Co.; Clark Construction Co.; Clear Lake Lumber & Building Co.; Clipper Mills Lumber Co.; Clepin Hamilton Lumber Co.; Concrete Steel Construction Co.; C. P. Plumbing Material Supply Co.; Double Starr Brick Co.; Douglas Clay Products Co.; D. R. Campbell Plumbing Co.; Elastic Roof Coating Co.; Engineering Contracting Co.; Eucalyptus Hardwood Mfg Co.; Eureka Bed Co.; Exposition Mill & Lumber Co.; F. A. Boole Lumber Co.; Filmore Mfg. & Hardware Co.; Frasier Lumber Co.; Fremont Iron Works; Glendora Lumber Co.; Globe Electrical Co.; Graham Nicholson Con. & Engineering Co.; Gransegli Plumbing Co.; Gray Bros. Crushed Rock Co.; Hackley Construction Co. (The); Henshaw Bulkley Co.; Herbert Construction Co.; Hicks Electric Co.; Hollywood Granite Co.; Holabird Electric Co. (The); Hovey Sash & Door Mfg. Co.; Houck Paint Co.; Howard Iron Works; H. Van Hees Contracting & Engineering Co.; Independent Brick Co.; Independent Electrical Construction Co.; Italian American Marble & Alabaster Co.; Johns Hanger Mfg. Co.; Journal of Electricity Publishing Co. (The); Keyts Sanitary Basin Plug Co.; Keystone Construction Co.; Kraus Painting Co.; Leitch Electric Co.; E. H. Kohn Hardware & Paint Co.; Lighting Fixture Co. of San Jose; Long Beach Electrical Manufacturing Co.; Los Angeles Blue Print and Supply Co.; Los Angeles Steel and Malleable Iron Co.; Los Angeles Varnish Co.; McCaustland Paint and Paper Co. (The); Machinery and Supply Co.; Manufacturers Agent's Assn.; Master Painters' Supply Co. of L. A.; M. Cronan Co.; Midway Brick Co.; Mt. Diablo Concrete Co.; Northern Hardware Co.; North Coast Pine & Redwood Co.; Oakland Bridge Co. (The); Oakland Builders' Supply Co. Inc.; Orchard Heating Co. (The); Oregon & California Lumber Corporation; Ornamental Cement Stone Co.; Oroville Concrete & Lavatine Construction Co. (The); Ozocerite Paint Co.; Pacific Consolidated Stone Co.; Pacific Clay Works; Pacific Hardware Co.; Pacific Jupiter Steel Co.; Pacific Malleable Iron Co.; Pacific Sash Weight Foundry; Pasadena Sash & Door Co.; Pasadena Building Co.; Peerless Paint & Chemical Co.; Pyramid Cement Products Co.; Reliable Floor Co. Inc.; Richmond Hardware & Plumbing Co.; Royal Heating Co.; San Diego Iron Works; San Francisco Art Glass Works; S. F. Stone & Brick Co.; San Francisco Hardware Co.; Sanitary Plumbing Appliance Co.; Silex Concrete Construction Co.; Southern Construction Co.; Southern California Contract-

ing Grading & Construction Co.; Specializing Hardware & Electrical Co.; Standard Plumbing Co (The); Standard Construction Co.; Standard Tile Mosaic & Cement Co.; Standard Woodworking Co.; Temescal Clay Products Co.; Turner Co. (The); United Building Co.; United Sheet Metal Works; United States Construction Co.; Ventilating Window Shade Co.; Visalia Building Material Co.; Western Crushed Rock, Sand and Gravel Co.; Western Art Tile Works; Western Engineering and Construction Co.; Western Steel Co.; Western Steel Works; Western Redwood Lumber Co.; Western Piling & Lumber Co.; Western Construction Co.; White Construction Co.; Williams Asphalt Mastic Co.

* * *

State Highway Work Soon to Begin

Commissioner N. D. Darlington of the California State Highway Commission states that indications now point to the commission being able to make its first call for bids from the contractors, for the construction of four or five pieces of the proposed new State system of highways, early in June. Probably the first work will be a grading contract in Mendocino county, a ten-mile stretch of road south from San Francisco to Burlingame, and a section in the San Joaquin Valley. It is planned, as heretofore announced, to begin work simultaneously in two or three or more parts of the State.

* * *

Architectural Club Meeting

"Cathedral Builders" was the subject of an interesting lecture delivered before the Los Angeles Architectural Club at its regular meeting on Thursday, May 2, by Ernest A. Batchelder, formerly of the Chicago Art Institute. The lecture was illustrated by stereopticon pictures from original drawings and photographs made by him during his travels in Europe. Mr. Batchelder showed pictures and gave detailed descriptions of a number of the medieval cathedrals of Europe.

Discussing the construction of these buildings, Mr. Batchelder said there were no architects but the work was done under the direction of master masons who worked out the designs on the ground as the building progressed. The architecture therefore was a development of the structural features of the building.

* * *

Simplest and Best

A fresh young recruit from the woods broke into fast company in the middle of last season and in his very first game was called upon to face Napoleon Lajoie, the great Cleveland slugger.

As the mighty Napoleon advanced to the bat the new man glanced about desperately and his eye fell on Umpire Bill Evans, who has a kind and gentle face.

"Mr. Evans," said the scared young pitcher, "this is my first game in the big league and I don't want to be beaten too badly. Please tell me what sort of a ball I ought to throw to Mr. Lajoie."

"Son," said Evans, "my advice to you is this: Say the Lord's Prayer, put the ball straight over the plate—and fall on your face!"—Saturday Evening Post.

Among the Architects

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San Francisco Chapter, A. I. A.

By SYLVAIN SCHNAITTACHER Secty

The regular monthly meeting of the San Francisco Chapter, American Institute of Architects, was held at the Tait-Zinkand Cafe on Thursday evening, April 18th

Mr Charles S. Kaiser, having filed the necessary application for Chapter membership and having been balloted upon, Messrs. Ross and Jacobs were appointed tellers to count the ballots. Forty-two ballots were received and counted, and Mr Kaiser was declared unanimously elected to Chapter membership.

The following communications were ordered received and placed on file: From Glenn Brown, Secretary of the A. I. A., letter and copy of resolution thanking the Chapter for presenting to the Institute the table known as the "Treaty of Ghent Table," and from the American Federation of Arts, regarding convention to be held May 9-10-11, 1912

The Chair announced the committee to meet with the General Contractors Association and the Building Trades Employers Association as follows: Frederick H Meyer, Chairman; Walter D Bliss, William Corlett, L B Dutton and August G Headman

The San Francisco City Hall Competition

Architect Walter Cook, of New York, has been selected as a member of the jury, from the list of three architects submitted by the Civic Center Architectural Commission to be voted on by the architects competing for the new San Francisco City Hall The other two architects were Irving K Pond, also of New York, and A F Rosenheim, of Los Angeles While over one hundred architects registered for the competition, it is believed that less than 60 will submit plans

Lionel Deane Resigns

At the recent meeting of the State Board of Architects held at Los Angeles, the resignation of Lionel Deane as Secretary and Treasurer of the Northern District Board, was accepted

Resolutions were adopted and entered into the minutes of the Board in appreciation of the service rendered by Mr Deane to the Board during his incumbency Sylvain Schnaittacher, of San Francisco, was selected to fill the vacancy

Splendid Office Building for Oakland

Architects Meyer and Reed of San Francisco and Oakland have plans for a fireproof class A store and office building to be erected at Seventeenth street and Broadway, Oakland, for the Thompson Estate The building will be 100 feet square and will have a steel frame with exterior of pressed brick and terra cotta The cost is estimated at $200,000

The Case of Architect Donovan

The charges preferred against Supervising Architect Donovan of Oakland have been dismissed and the complainants have taken an appea

Architect C W Dickey has asked the San Francisco Chapter of the American Institute of Architects for an opinion as to whether the ordinance as passed in Oakland, creating the office of Supervising Architect would meet with the Chapter's approval and whether the latter would consider it proper for an architect to accept services under Mr Donovan The matter has been referred to a special committee composed of William Mooser, Edgar Matt Matthews and William C Hayes.

Supervisor McLeran Doing Good Work

Supervisor McLeran is doing good work in keeping things humming in the San Francisco City Architect's department McLeran champions any measure in the Board that provides for prompt action in construction work Figures have been taken for the Stockton street fire house and contracts will be let shortly for another police station and the Patrick Henry School house The Supervisors are anxious to get started on the new $1,000,000 auditorium and the mater is before the City Architect's office now The question of who will design the structure is one in which keen interest is being manifested by the members of the architectural profession

Move to New Offices

Architect T. Patterson Ross and Engineer A W Burgren have moved from Kearny street, where they have been located since the fire, to an attractive suite of offices on California street

Architect William H Weeks who is at present occupying part of the seventh floor of the Corcoran building, San Francisco, will soon move to the Dr Wayland building now being completed on Post street, adjoining the Mechanic's Institute building Mr Weeks will have the entire second floor which will be especially fitted up for his occupancy

Form Partnership

Walter C Falch and Andrew H Knoll both of whom were for some time in the employ of Architects Bliss and Faville of San Francisco have formed a partnership and opened offices in the Hearst building for the practice of their profession They have taken two contracts one an apartment house and the other a residence, and plans are under way for several other buildings, including a five story class C store and apartment building to be erected at Bush and Leavenworth streets San Francisco

World's Fair Notes.

Houses are being dismantled and removed from the Exposition site in preparation for the 1915 Universal Exposition. Workmen are now actively engaged tearing down structures that were landmarks in the Harbor View district. These buildings will be replaced by Exposition palaces, that are being planned by the foremost architects of this country. Homes that were valued at three and four thousand dollars are being moved to other sections of the city and on the land they occupied, will arise magnificent buildings that will cost in the neighborhood of $500,000 each.

* *

The filling in of the overflow land comprising 71 acres on the Harbor View site at the foot of Webster street, is progressing rapidly. The giant dredger, "John McMullin," is pumping mud from the bay fronting the 1915 Universal Exposition site, through pipes half a mile in length. As soon as this property is filled in, work for improving the same for exposition purposes will be taken up and put through expeditiously. It will go on rapidly and President Moore and the Directors of the Exposition have given positive assurances that when the doors of the Exposition open on February 20th, 1915, the world will see a complete exposition. The Exposition closes on December 4th, 1915.

* *

The Board of Supervisors of Humboldt County have set aside $90,000 for that county's participation in the 1915 Universal Exposition. W. F. Clark, Vice-president of the Bank of Eureka and one of the largest real estate owners of that city and J. F. Coonin, a prominent attorney of Eureka have been appointed Commissioners by the Board of Supervisors and visited this city last week for conference with the Exposition officials.

* *

Allan Pollok, Comptroller of the 1915 Universal Exposition has submitted to President Moore a statement of receipts and disbursements from the commencement of business in November, 1909 to March 30th, 1912. In this statement he shows that the total amount of signed subscriptions to date, is $6,065,790.00 and that the total cash received from subscriptions and other sources amounts to $1,725,349.65. He also states that the total disbursements of every nature and description amounts to $949,307.02, which includes $430,999.40 for expenditures for site purposes. He reports that there is an unexpended balance of $776,042.63. In his letter to President Moore, the Comptroller states:

"Collections on subscriptions have been surprisingly satisfactory, amounting in all to $1,707,639.66, or 28.15% of the total amount subscribed; this despite the fact that no extra means have been taken to secure payments on assessments falling due, and that, nothwithstanding the extraordinary amount of preliminary work being done, but little physical construcrure has been commenced."

Fine Banking Room

The German American Savings Bank, Fourth and Spring streets, Los Angeles, has secured a lease on the ground floor and basement of the Union Oil building at Seventh and Spring streets and is having plans drawn for one of the finest banking rooms in the West. The bank will install a mezzanine floor, marble fixtures, safe deposit and coin vaults, lockers, heating and ventilating apparatus, pneumatic tube system, circulating ice water plant, three elevators to run from the basement to the mezzanine story, etc. The plans are being drawn by Architect Parkinson & Bergstrom, and Weary & Alford of Chicago and San Francisco.

Catalogs and Samples

Thomas Fellows, who has been appointed superintendent of construction for the engineering department of the State of California, is now established in his new offices in the Exposition Building, Los Angeles. Mr. Fellows is preparing plans for several State buildings to be built in Southern California and desires catalogs and samples from material dealers. If literature and samples are enclosed in a letter file with a complete list of the contents on the face of the file, they will be greatly appreciated and preserved for future reference.

Johnson Goes With Aetna Liability

S. W. Johnson, expert surety underwriter, who has been for seven or eight years with the Paul M. Nippert Company, Inc., has resigned as Asst. District Manager of Fidelity & Deposit Co., of Maryland, to accept an appointment as manager of the fidelity and surety department of the Western branch office of the Aetna Accident & Liability Co., at San Francisco, in charge of J. R. Malony.

Mr. Johnson is a young man of recognized ability and is considered one of the best fidelity and surety men in San Francisco. He will assume the duties of his new position in a short time. It is the purpose of the Aetna Accident and Liability to make its Western office a very important branch of its fidelity and surety bond business. It is to be congratulated on securing the services of Mr. Johnson.

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GIVE THE ARCHITECT PROTECTION

Our attention has been called by a number of reputable California architects to a growing practice on the part of certain corporations—particularly those dealing in mill work and lumber—of employing experienced draftsmen to turn out complete drawings for a building which are presented to prospective builders without charge.

One of the most flagrant examples is in Santa Cruz county, where a big corporation is known to have outwitted a well known architect of a six-per-cent commission by literally "donating" a set of plans and specifications for a $70,000 business building, provided the builder agreed to purchase his material from the company. This, we think, is going a bit too far and the case should receive the immediate attention of the local Chapter of the American Institute. In becoming a member of this institution the architect naturally looks for some protection. It is the duty of the Chapter to prevent, if possible, just such abuses; otherwise there would be no limit to such practices and eventually the profession would find itself in a demoralized state. It is bad enough to have the small contractor make his own plans for residence work, but when the lumber mills go into the designing of business structures, it would seem to be time to call a halt. In connection with the "architectural" work that is being done by the Santa Cruz firm in question, it may be added that but for the prompt action of an expert engineer, a big packing house that was faultily designed, would have gone down recently with probable loss of life and property.

DR. JEKYL AND MR. HYDE

A dual impersonation is not confined to the stage. We see it in real life—in trade, commerce, politics and the professions. In architecture and engineering we come across cases where the "side line" is resorted to. The clergyman

who is a contractor lays himself open to a charge of weakness and insincerity. The same with a publisher who is also a carpenter. What shall be said, then, of architects who are financially interested in the fixtures they specify, or consulting engineers who accept retainers to inspect materials for which they are acting as selling agents? Of course they would be doubly careful in passing their own goods—but the world is a bit harsh at times in its judgments, and it is just as well, like Caesar's wife, to be "above suspicion" and "avoid all appearances of evil."

FIRE PREVENTION

The January issue of the National Fire Protection Association's Quarterly Bulletin contains a syllabus which is intended for use in public instruction in fire prevention. The syllabus is primarily arranged for school children, but certain parts of it should be sent ringing across the country into the ears of old and young alike. It is not only the child, but the business man as well who should understand what the abnormal fire loss means to this country. The child can be taught to be careful about the little things that cause fire and the common preventives which will make fires less of a common occurrence than they are now. The business man must be taught to look out for the big things as well as the small. With him rests the commercial prosperity of the nation. He should be instructed in the greater protective measures. His should be the greater responsibility. School teachers can instruct children how to prevent fires. Who will teach the business man to guard against them? When that teacher is found, the country will have taken a long step forward. The National Fire Protection Association prints a few paragraphs on the economic significance of the fire waste. Here are a few burning paragraphs:

"A burned city does not replace itself.

"Fire insurance does not replace lost property.

"Food, clothing and shelter are produced only by human effort, hence labor expended in *replacing waste* is withdrawn from legitimate production for the satisfaction of human needs.

"The fire waste is not really paid for by insurance companies.

"Fire insurance is added by manufacturers and merchants to the cost of the goods, and whoever buys a loaf of bread, a hat, a coat or a shoe pays it. The cost of the fire tax is concealed in the price of the goods.

"Every fire is paid for by all the people. Insurance is collected from all and paid to him who has a fire; hence the man who has a fire intentionally or unintentionally takes money from the pockets of his neighbors. Fire insurance is an assessment upon all to pay to one; hence every fire makes every man's struggle for a living harder by compelling him to spend for his neighbor's waste what he might otherwise spend for his own comfort."

As Others See Us

(From the Pacific Builder, Seattle.)

William Martell, general contractor, who has been spending the winter in Southern California, is back in Seattle on business. Mr. Martell is much interested in highway construction and, while he appreciates the activity California has taken through the creation of its highway commission and the plan to spend some $18,000,000 during the next three years on 2,300 miles of north and south trunk roads, he does not stand for the cheap construction which is, therein, indicated. He says that the policy of the commission is towards cheap highways, when he thinks that a substantial brick or stone road should be laid.

The California State Highway Commission is actively pushing the preliminary work with seven division parties in the field, covering the interior and coast roads from San Diego to the Oregon line. One of these roads will make the connecting link in the Pacific highway.

Part of the engineering work on these roads will be completed and F. A. Fletcher, State Highway Commissioner will be calling for bids on the work about June 1.

Mr. Martell states that the worst section of the Pacific highway is not in California, but in Washington between Centralia and Portland, Oregon.

The labor situation and construction work, according to Mr. Martell, is not as favorable as in the Greater Northwest. The Industrial Workers of the World are meeting with many unsurmountable obstacles, and there are at present some 50,000 men in San Francisco, and 40,000 men in Los Angeles out of work.

Exposition work, both at San Francisco and San Diego, is not progressing as rapidly as one would wish or expect. Practically nothing has been done at San Diego, and a small force is at work in San Francisco.

State, County and Municipal Engineering

Good Roads—Water—Sewers—Bridges—Fire Protection

Good Roads

The economic question of road building is how to raise the necessary funds. The methods usually employed to do this are:

(1) By property and poll taxes; (2) By statute labor; (3) By bond issues, state or county; (4) By state aid; (5) By toll levied upon travellers; (6) By vehicle licenses; (7) By various combinations of two or more of these methods.

In the earliest days all roads were built and maintained by statute labor. The work done by the able-bodied citizens, between certain ages, who lived along the road.

Most states have now adopted some form of property tax, payable in cash or labor to be expended upon road maintenance. The building of turnpike or toll roads by chartered companies which was inaugurated in the 18th century has proven generally unsuccessful and has gradually been abandoned. In 1904 some states authorized the issue of bonds for road improvement, providing that bonds might be issued by county authority or by township, or district authorities, or by cities having a certain population. The state aid by which the state co-operates with counties and townships has become popular, particularly in the Eastern states.

Reasons for Interest in Good Roads

If you are a farmer, because your farm will increase in value, you can raise more profitable crops, your cost of hauling will be lower, you can market your products when prices are best, your children can get to school, your family can attend church, your physician will be in closer touch with you, your boys and girls will stay on the farm, you will have better mail service, more social life and happier conditions all around.

If you are a merchant, because good roads enlarge your trading radius and make it possible for purchasers to reach you every day in the year, and thereby increase your sales.

If you represent a chamber of commerce or a board of trade, because the public roads are commercial feeders to the city, and every improvement of these roads means a greater prosperity to the cities through increased agricultural production and greater stimulus to all industries.

If you are a highway official, because you are striving for better methods of road construction and maintenance, and more efficient road administration.

If you are a railroad man, because improved roads mean greater production, consequently more traffic, prevent freight congestion, bring more industries, more roads, more tourists.

If you are an automobile user, because you can get the benefit of your machine every day in the year, your repair bills will be lower, longer and better tours will be possible at all seasons of the year.

If you are a dealer in farm products and implements, because you can receive the products and deliver the implements at all times.

If you are an automobile manufacturer, because every mile of improved roads means a greater demand for both pleasure and commercial cars, increases wealth, and consequently the power to purchase.

If you are a manufacturer of road machinery or road materials, because road improvements means more business.

If you are the proprietor of a hotel, because improved roads means more tourists and more commercial travel. New England, with its system of good roads, gets $60,000,000 a year from tourists alone.

If you are a publisher or editor, because improved roads make wider circulation possible, increase advertising by stimulating commercial enterprises and because road improvement is the most important economic question of the age.

If you are a progressive citizen, because you cannot progress so long as your state and nation remain in the mud.

First Paved Street in America.

Stone street, New York City, got its name because it was the first street in this country to be paved with stone. That was about 200 years ago. The stones were probably cobbles. Now street paving is one of the great industries of the country everywhere in cities and towns. The first paving materials were brick and flagstone, and these were used mostly for sidewalks. The macadamiz-

ing of roadways began nearly a hundred years ago. The first use of asphalt on a large scale was in Central Park, New York. Blocks of wood, end up, were much used for some time after 1870. Now block stone is the principal paving material where heavy hauling is to be done, while brick is a great favorite in suburban communities.

Just Like Old Caesar Did!

"When Caesar took a westward ride and grabbed the Gauls for Rome, what was the first thing that he did to make them feel at home? Did he increase the people's loads and liberty forbid? No, he dug in and built good roads—that's what old Caesar did. Did Caesar put the iron heel upon the foeman's breast, or did he try to make them feel the Roman rule was best. What did he do to make them glad he'd come their midst amid? He built good roads in place of bad—that's what old Caesar did. He built good roads from hill to hill, good roads from vale to vale; he ran a good roads movement till old Rome was strong and hale. He told the folks to buy at home, built roads their hills amid, until all roads led up to Rome—that's what old Caesar did. If any town would make the town the center of the map, where folks will come and settle down and live in plenty's lap, if any town its own abodes or poverty would rid, let it get out and build good roads—just like old Caesar did."—Good Roads.

State Highway Surveys Ordered

Orders for preliminary surveys, plans, and estimates for 328 miles of additional highways under the $18,000,000 bond issue have been issued by the State Highway Commission to Highway Engineer A. B. Fletcher, thus completing orders for surveys on more than one-half of the total mileage of roadway planned for construction on the present bond issue. Surveys are now under way for 850 miles and the last order will bring the total to 1178 miles. The total mileage proposed is 2295.

The new surveys ordered are parts of four out of the nine general routes included in the entire plan for proposed work by the Commission. They include three links on route 1, which is the proposed highway from San Francisco along the coast to the Oregon line; three links on route 2, which is the proposed road from San Francisco to San Diego, along the coast; one link on route 3, the proposed highway from Sacramento to Los Angeles, via the San Joaquin valley, and one link on route 5, the proposed route from Stockton to Santa Cruz, via Oakland.

Fireproof Maxims

BY THOMAS FELLOWS.

A fireless constructor is one who so designs and builds that fires are impossible in his buildings.

* *

Have your state make uniform building laws. Co-operate with towns and cities to secure their enforcement. Test new building material. Try new modes of construction.

* *

Make office furniture fireproof (not iron). Concrete furniture lighter than wood was made. (Not by Edison.)

* *

Concrete can be made to look cheerful and not depressing. Choose warm-toned aggregates and give natural soft texture stones. Plan and build for the coming years.

* *

Train city building authorities, fire departments, etc., so that fire prevention and not fire extinguishing is the aim and end.

* *

New York City spends $10,000,000 annually to put fires out, and $10,000 to prevent fires.

* *

We need more preventive and not curative methods of fire fighting. Train fire departments so that the men can become experts in fire prevention.

* *

Set the State University at work. Let our would-be engineers write theses on fire prevention.

* *

Erect one model low-priced fireproof residence, store and schoolhouse in every city. Then urge the architects to design beautiful fireproof low-priced buildings.

A New California Industry

A full fledged paint works has sprung up in our midst, almost without heralding. The Pacific Coast Kalsomine Co. has established their factory at Nobel, Alameda county, and enter the field against Eastern concerns with a line of Kalsomines, Waterproofing, Dampproofing, Fire-retardant, Exterior, Interior and Wall Paints, Enamels and Finishes. They claim that their line is more durable, sanitary, artistic and economical than any competing product. They have established a sales office in the Hansford Building, San Francisco, and are sending out a number of experienced salesmen to acquaint the building trades with the superiority of their specialties. Their attractive series of color cards will be sent to any one interested and are well worth careful inspection. Their slogan, "Made on the Coast," should secure for them a careful hearing by architects and contractors.

HEATING AND LIGHTING

Plumbing and Electrical Work

Electric Talk

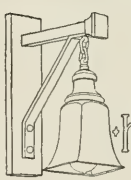
EVERY business has its own language and nomenclature. The average Wall street operator for instance, can tie a neophyte's brain into hard knots in the course of a few moment's conversation on fiscal matters. But the business which presents itself to the layman as the most hopeless riddle is electrical manufacturing. Dr. Schuyler Skaats Wheeler, President of the Crocker-Wheeler Co., of New Jersey, recently deplored in a public utterance the spirit of opposition which has grown up between the electrical engineer and the world at large.

"You cannot talk electrical terms to the average layman," he said, "without scaring him to death. The mention of anything as induction coils is sure to set his wits to wandering. A certain method of immediately losing your auditor's attention is to make use of a technical term."

Electricity, like Browning, is not difficult to understand if you approach it fearlessly, undaunted by the "Electrictalk" which has been coined during the last couple of decades. There is a definite, logical reason why each one of the terms is in use, and in another decade they will be as familiar to that part of the public which is interested as automobile talk is fast becoming to the public at large. At present "Electrictalk" makes the average man feel that "be it ever so humble there's no place like home."

The units of measurement are the basis of "Electrictalk"—amperes, volts and watts. Ampere is the name of the Frenchman who discovered how to measure electric current. The unit of measurement was therefore called an ampere in acknowledgement of his valuable discovery. Electricity may be best compared to water flowing through a pipe. The volume, or gallons of water, correspond to the volume, or amperes of electricity. But water may flow at greater or less pressure. A thousand gallons of water flowing through a pipe at one pound pressure to the square inch would just dribble out at the end. Under a thousand pounds' pressure to the square inch it would shoot out of the pipe with fierce energy. The number of pounds of pressure under which water is flowing corresponds to the number of volts of pressure under which an electric current is flowing.

The energy with which water flows out of a pipe is the result of the volume of water and the pressure under which it is flowing. Everyone has noticed how much faster water flows out of a faucet in one place than it does out of a faucet in another. The quantity of water which flows out of the faucet depends



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upon the water pressure in that particular locality. In the same way the quantity of electricity delivered over a single circuit is the product of the volume (amperes) multiplied by the pressure (volts). The electrical term for the energy thus generated is watts. A thousand watts are called a kilowatt, as this term is part of the metric system.

In order to understand just what a kilowatt is, it is necessary to ascertain what it will do. We know that a stream of water of a given volume flowing at a given pressure into a turbine will generate a certain quantity of horsepower of energy. A kilowatt is the mechanical equivalent of one and a third horsepower. Electric lighting circuits usually carry 110 to 120 volts. An ordinary carbon sixteen candle-power lamp takes a little less than half the ampere in volume, and consequently consumes about fifty watts of current. As a thousand watts are equal to one and a third horsepower, fifty watts are equal to less than seven hundredths of a horsepower. A Tungsten twenty candle-power lamp takes less than a quarter of an ampere, or about three-hundredths of a horsepower.

It is interesting to remember in this connection that a horsepower is actually based as a measure of energy on the amount of power that could be produced by a horse. In the old days before wheels began to be turned by steam they were turned by a horse walking on a treadmill. When the ingenuity of man had discovered steam power it was necessary to have a measure that would convey what it could accomplish in terms then in usage and understood. The man with a steam engine to sell said in substance, "My steam engine can do more than ten of your horses." Hence the expression ten-horsepower engine. The man with the steam engine found it necessary, however, to be overconservative in his statements in order to spread belief in his new-fangled machine. He understated, therefore, the amount of work that his steam engine would perform, so that a mechanical horsepower is actually a good deal more than a horse on a treadmill can really accomplish. In the same way manufacturers of electrical machinery have found it necessary to rate their machines exceedingly low. The rating of a machine is its capacity to develop a certain power at a certain speed. In other words, popular incredulity has affected scientific terms to such an extent as to render them not strictly accurate.

Selling Paint with Stripes In It.

An automobile drove up to the front of a large retail paint store in one of the big cities recently. The chauffeur jumped out and opened the door for an elegantly dressed lady whose every motion and appearance bore the mark of education, culture and refinement. She walked into the store and with her eyes swept, with a single glance, the shelves full of cans of paints, stains, and varnishes.

To the clerk who approached she said: "Do you keep all kinds of paints?"

The awed clerk meekly replied: "Yes, ma'am."

"Do you have all colors?" she continued?

"Yes, ma'am," again replied the clerk.

"Then," she said, 'I want a quart of green paint with a white stripe in it."

As soon as the clerk recovered himself he asked her the purpose for which she wanted the paint. She told him and then he told her that paint did not come like ribbons, but that she would have to buy the two colors separately and put on the white stripe afterwards.

"Oh," said she, "is that the way? All right, just wrap them up and give them to James in the automobile."

After she had departed, the clerk thoughtfully laughed.—Paint, Oil and Drug Review.

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The Church Luminous

LIGHT in all ages has been the universal symbol of morality, knowledge and religion. The Christian church especially has made distinct use of the symbol, following the precedent set by the older Hebraic religious rites, of which it is the successor. More especially still has artificial lighting been symbolically used in that great division of the Christian church known as the Catholic. In the festivities expressing the enthusiasm and veneration of those of his faith in the return of their former beloved Archbishop, raised to the higher dignity of Cardinal Farley, it was natural and fitting that this ancient symbol should be utilized to the utmost in the possibilities afforded by modern science. The special illumination of St. Patrick's Cathedral, on Fifth avenue, New York, was probably the most elaborate use of artificial light that has ever been made in connection with a church service, and it will in no wise detract from the sacredness of the occasion celebrated to describe the methods used to accomplish this wonderful result.

Courtesy The Illuminating Engineer

Wiring the Towers of St. Patrick's for Illumination. Puzzle: Find the Wireman.

Copyright by the N. Y. Edison Co.

The exterior lighting was carried to the cross-surmounted tips of the two great spires, 340 feet above the sidewalk. In carrying the wires to this dizzy height Steeplejack Merrill had to take a special three days' course in electric wiring. He predicts that in the future the main part of the steeplejack's work will be electric wiring, and he is going to be up with the times. He had three assistants to aid him in stringing the lights.

All of the arches, buttresses, windows, doors and all of the horizontal and vertical lines were outlined in electric lamps, while over the main entrance blazed in colored electric lights the coat-of-arms of the new Cardinal. There were 50,000 8 c-p. lamps used on the cathedral, 20 miles of wire, and a mile of low tension feeder from the Edison sub-station at Fifty-third street and Sixth avenue to and around the cathedral.

The current consumed by the lamps was equal to 1200 h.-p. On the spires alone there were 11,000 lamps.

In the interior 40-watt Mazda lamps of 32 c.-p. were used in place of the old-fashioned 16 c.-p. carbon lamps. The total installation contained 2,100 lamps. The seven great chandeliers, of 100 lamps, were lowered 20 feet. These fixtures are so high that this change was not especially noticeable as an architectural feature, although it altered greatly the lighting effect. Five of these chandeliers are in the nave and one in each of the transcepts. They are 130 feet above the floor and so heavy that the combined strength of four men was required to hold the pulley ropes during the lowering operation.

At the top of each column in the body of the church is a cluster of lamps. As formerly arranged they were almost worthless as far as reading in the pews was concerned. Special tests were made to determine the best method of placing them so that the illumination would be thrown directly on the pews.

Additions were made in the sanctuary illumination to accentuate the beauty of the marble altar and reredos, but the altar itself was untouched. It is by means of lights concealed behind the piers that this part of the cathedral was illuminated, while a chandlier was placed over the vault where the archbishops are buried.

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The Glorified Cathedral
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The Problem of School Room Ventilation

Dr. C. Ward Crampton, director of Physical Training in the New York public schools, gives the following interesting facts regarding the problem of school room ventilation in that city and the efforts being made to remedy faulty heating and ventilating systems:

"Two years ago, before the present popular agitation began, it became evident to me that many of the classrooms were overheated and that the then existing temoerature standard of 68 degrees to 72 degrees F. was too high. Not only was it too high, but temperatures of 76 degrees and 78 degrees were common. Accordingly, the standard classroom temperature was lowered to 65 degrees to 68 degrees F., and the gymnasium temperature to 60 degrees to 65 degrees F. This naturally diminished the overheating, but it has not eliminated it.

"The agitation against our present mode of forced ventilation is mainly, if not wholly, the result of observations of these overheated classrooms and of some classrooms where defective apparatus is delivering but little fresh air. No one who has taught in or observed a classroom at its proper temperature, 65 degrees to 68 degrees F., with the plenum systems working properly, has ever complained to me that the ventilation was poor, for it was not poor.

"The overheating is due, as a rule, to defective diaphragms in the direct radiation control and to other failures of the thermostat control. The occasional failure of the fan and duct mechanism is due to faulty control or lack of much-needed repairs.

"The worst-ventilated rooms in the city, where I have found the air actually foul, are in the old buildings where we do not have plenum systems and the windows are relied upon exclusively for fresh air. It is evident that window ventilation can never furnish sufficient air for from 40 to 60 children in a room without some of the children being subjected to dangerous drafts of cold air. The result has always been that drafts are avoided and the air becomes bad.

"The faults I find with the present systems are as follows:

"(1.) They are not automatic. It requires constant expert care, testing and renewal of important parts which quickly deteriorate. This is a matter which should be taken up most seriously by members of the heating and ventilating profession. We cannot afford, it is clear, to pay more money for expert janitorial services, and while, in the main, the janitor engineer is expert and vigilant, yet there cannot fail to be exceptions. I maintain that there should be devised systems of automatic control that are really automatic and should not depend, to the present large degree, at least, upon human variability.

"(2.) The present heating and ventilating systems often decrease the relative humidity of the air down to a point from 10% to 30%, which I consider deleterious. This can be corrected by evaporating pans, steam jets or mechanical fragmentation of water. At the present time, experiments of the various methods of humidifying the air are being conducted by Mr C. B. J. Snyder.

"There has been some talk about the physician being unable to set standards for ventilation. If you can guarantee a temperature of from 65 degrees to 68 degrees F. and an even relative humidity of from 45% to 55%, and a sufficient vol-

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ume of fresh air (in accordance with present standards) mildly stirring about the room, I shall be satisfied.

"I look to the future to improve ordinary outside air and make it mildly stimulating by the change of some of its O^2 and O^3. At present the difficulty with ozonizing apparatus is to secure constant results, and I am frankly in doubt exactly what percentage of ozone is desirable, on account of the present difficulties of control of supply. With this condition remedied, we shall be able to set standards for this new and comparatively unstudied factor in ventilation."

Technologic Papers

The Department of Commerce and Labor has issued another volume of "Technologic Papers of the Bureau of Standards." It contains the results of tests of strength of 333 concrete beams, and forms a part of the study of the behavior of reinforced concrete beams under load, as influenced by the character of the concrete and the arrangement and percentage of reinforcement. The book has numerous tables, charts and illustrations showing the methods used for compressive stress, the development of cracks, during a period of from four to fifty-two weeks, and other valuable information for the engineer and architect.

Sanitary Drinking Fountains

Wittman, Lyman & Co., of 315 Polk street, San Francisco, are selling agents for the Lilley Drinking Fountain, which is manufactured by Scott, Lyman & Stack, of Sacramento. The San Francisco Board of Education has adopted this drinking fountain for use in the public schools, and it is also being generally used in public and private buildings and parks and on street corners throughout the State. It is simple in construction, with no metal parts to touch the lips and no waste of water.

The Advertiser's Creed

I believe in publicity and in every legitimate method of catching the eye and reaching the ear of any possible customer.

I believe that repetition must result in emphasis, that emphasis must in time attract attention, that attention must create interest, that interest must yield orders.

I believe that the way to sell goods is to advertise them, to tell people about them continually, to talk straight and to talk honest.

I believe that the market is as big as the world, that a slice of it belongs to me, that my goods are worthy of it, and that I am going to get it.

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Are manufactured from pure English ground colors and wood-preserving oils.
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By the Way

Some Industrial Information Worth the While

Specifications for Tin Roofing

J. A. Drummond, Pacific Coast representative of the N. & G Taylor Company is passing out to the architects the following standard specifications for tin roofing:

Tin Roofing Work—All tin used on this building shall be N. & G. Taylor Co.'s "Target & Arrow" brand. No substitute for this brand will be allowed. Use IC thickness for the roof proper, decks, etc, and IX thickness for valleys, gutters and spouts, as required by design One coat of red lead, iron oxide, metallic brown or Venetian red paint, with pure linseed oil, shall be applied to the under side of the tin before laying.

For flat-seam roofing, edges of sheets to be turned one-half inch; all seams to be locked together and well soaked with solder Sheets to be fastened to the sheathing-boards by cleats spaced eight inches apart, cleats locked into the seams and fastened to the roof with two one-inch barbed wire nails; no nails to be driven through the sheets.

For standing-seam roofing, sheets to be put together in long lengths in the shop, cross seams to be locked together and well soaked with solder; sheets to be made up the narrow way in the rolls and fastened to the sheathing-boards by cleats spaced one foot apart.

Valleys and gutters to be formed with flat seams well soldered, sheets to be laid the narrow way.

Flashings to be let into the joints of the brick or stonework, and cemented. If counterflashings are used, the lower edge of the counter-part shall be kept at least three inches above the roof.

Solder to be of the best grade, bearing the manufacturer's name and guaranteed one-half tin and one-half lead—new metals. Use rosin only as a flux.

Caution — No unnecessary walking over the tin roof or using same for storage of material shall be allowed. In walking on the tin care must be taken not to damage the paint nor break the coating of the tin. Rubber-soled shoes or overshoes should be worn by the men on the roof.

Painting Tin Work—All painting of the tin work to be done by the roofer, using red lead, iron oxide, metallic brown or

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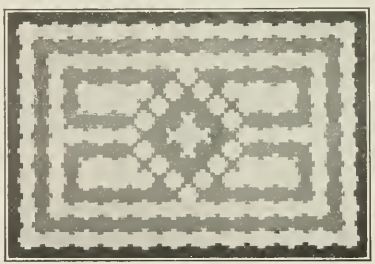

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Venetian red paint, with pure linseed oil —no patent dryer or turpentine to be used.

All paints to he applied with a hand-brush and well rubbed on. Tin to be painted immediately after laying. A second coat shall be applied in a similar manner, two weeks later.

No deviation from these specifications shall be made unless authority is given in writing by the architect. Only a first-class roof will accepted.

A Hand Book on Waterproofing

One of the latest publications issued by the Trussed Concrete Steel Company of Detroit, is called the Trus-Con Hand Book, devoted particularly to the subjects of waterproofing, damp-proofing and technical paints.

This publication gives a complete discussion of all the various methods of protecting masonry, concrete, plaster and steel against water, dampness, etc. Full analyses of various conditions are treated and a particular remedy suggested in each case. Specifications and directions for use of various methods and materials are given in detail.

The question of waterproofing and finishing is today receiving careful attention of all persons interested in the building trades. A publication, such as the Trus-Con Hand Book ought to prove interesting to readers of this magazine, and a copy will be mailed free on request.

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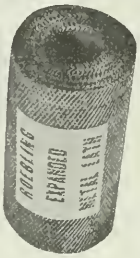

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An Interlocking Hollow Brick

The Los Angeles Pressed Brick Co. has been licensed to manufacture the new Denison interlocking hollow brick and is preparing to make this improved hollow brick for wall construction on an extensive scale. The field for its use seems unlimited and already there is a big demand for it that will tax the capacity of the plant's output to the limit for some time. The factory being reconstructed at Santa Monica is to be equipped with the Denison machines.

The Denison interlocking hollow brick has been passed upon by eminent engineers and several commissions back East for its strength, where it has been used in several large structures. In Cleveland the building ordinance was amended to admit of hollow tile blocks being loaded 200 pounds per square inch of available web section, said to be less than 10 per cent of its actual carrying capacity; as applied to the Denison interlocking brick this is claimed to permit its being safely loaded over five tons per square feet of wall area. It is also claimed that this new brick is more rigid and stable than walls of common brick. Each of the blocks displaces nine common brick, and laying up a wall with them, including mortar, costs less than half that of common brick walls. Each block has two beds at different elevations which form a triangular brace each with the other, and all are interlocked, and thoroughly bonded together.

The Denison interlocking brick or block are made in one shape and size to build all desirable thicknesses of walls, They are specially adapted to stucco houses, walls faced with common or face brick, foundations, partitions, etc.

A Progressive Man's Expansive Bolt

The Brohard Expansion bolts should appeal to the progressive man who is always seeking for the best, safest and securest fastenings. The American Bridge Company adopted the machine shield as standard. The Otis Elevator Company use them at all their plants and the many other equally well-known firms using these bolts seem to bear out their claim as the best on the market. The machine bolt is practically one piece, so also will be the new lag screw shield soon to be introduced. Both will fasten any material securely and tightly, as the nut is not drawn up to separate the sides of shield, until head of bolt strikes the material. These bolts emphasize the **Watchword—Safety.** They wish agents in San Francisco, Portland, Seattle, Salt Lake, Spokane and Tacoma.

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Using Sandstone Brick

Siller Brothers, who are erecting a new office building at Ninth and L stretts, Sacramento, at a cost of about $100,000, are to use a home product—sandstone brick—for the facing of the front of the structure. The Sacramento Sandstone Brick Company, one of the few in the world manufacturing brick from lime and sand, entered the local field a little more than a year ago, building a plant near the confluence of the Sacramento and the American Rivers. Since that time the new type of brick has been used in several buildings, but Siller Brothers are the first to use the material for the facing of the entire front.

For Concrete Workers

We are in receipt from the publishers, the Norman W. Henley Publishing Company, 132 Nassau street, New York, two handy little reference books relating to the construction of concrete porches and concrete bridges, culverts and sewers. They contain designs and details for the construction of ornamental concrete bridges and the method of making the molds. Numerous illustrations show how to arrange and get the work in shape and how to make a new type of collapsible core mold. The price is 50 cents each.

Locke Company is Re-organized

The Locke Foundation Company which has been doing a contracting business in San Francisco for the past two years, recently has been re-organized, and has taken the name of the Locke Construction Company, Incorporated. The company will do a general contracting business and is in a position to figure any and all jobs, both large and small.

A. C. F. Locke who has been elected president of the company, is well known to the architectural profession and building trade in San Francisco as a thoroughly competent engineer and superintendent of construction. The heavy concrete foundations in the double basement of the Banker's hotel, Oakland, were put in under Mr. Locke's personal supervision. The other officers of the company are: Vice-president, F. P. Howard; Secretary and Treasurer, C. F. Nourse; Directors, Charles L. Brown of San Francisco, C. B. Campbell of Orange, and Messrs. Locke, Howard and Nourse.

The company will take work out of town as well as in San Francisco. Several buildings have recently been completed for the government at the Presidio and the company has also done considerable work for the Scott and Van Arsdale Estate and the Crocker Estate.

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New Factory for Reliance Ball-Bearing Door Hanger Co.

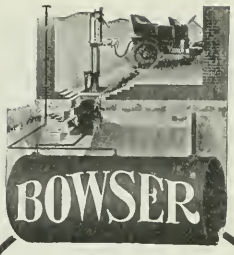
One of the most remarkable growths of a firm manufacturing hardware specialties is that of the Reliance Ball-Bearing Door Hanger Company of New York and Brooklyn. This firm manufactures Reliance ball-bearing door hangers and elevator door locks, and although it has been in business less than nine years, it has become nationally known for the cleverness and efficiency of its patented devices. Hardly a building of any prominence from Main to California and from Canada to the Gulf is put up these days without serious consideration by the architect of the Reliance company's specialties; and it is safe to say that fully eighty per cent of these modern buildings have had Reliance hangers or elevator door locks specified and installed.

Such an enormous demand from all parts of the country has, of course, at times heavily overloaded the capacity of the company's factory, notwithstanding energetic and intelligent efforts on the part of the company to increase its output. From time to time the size of the plant has been increased, additional machines set up, etc., but by the time these added facilities were completed and put into operation, orders still out-stripped the factory's capacity.

As an illustration of the demand put upon the Reliance plant, an order was received recently from eleven hundred and fifty-six hangers, for one huge office building in New York City, and this is only part of the order. Other orders received by the company within the last few weeks have run from one hundred to four hundred hangers each for single buildings. As these hangers are all of special construction, size, etc., have to be turned out within a given time, and every hanger thoroughly tested before leaving the plant, it can readily be seen the enormous strain that is put upon the manufacturing department of a company which has been in existence but a few years.

The result of this demand has been that the Reliance company has now built and equipped a new factory that will have more than double the capacity of its old plant on Himrod street, Brooklyn. This new factory located 280-282-284 Starr street, Brooklyn, is thoroughly modern and up-to-date in every way, many of the machines being designed especially for the work. The new plant will be ready about May 1st, and after it is once in operation the Reliance people expect to be able to fill all orders without delay.

Reliance hangers have also made a name for themselves in Europe and are extensively distributed throughout Great Britain and the Continent, a large factory for the manufacture of the hangers being situated in Germany.



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Rolling Rudgear High Tensile Steel Bars

Rudgear-Merle Company are Manufacturing Reinforcing Bars

THE general use of concrete in construction of buildings, bridges, reservoirs, tanks, sewers, etc., has created a tremendous demand for reinforcing bars, round, square and twisted. It has been a matter of comment that more of this material has not been manufactured on this Coast. It is only recently that a San Francisco firm—The Rudgear-Merle Company—widely known throughout the Coast as makers of ornamental iron and bronze work, have installed at a large expense, furnaces and a rolling mill, which enables them to produce in large quantities a high tensile steel that is calculated to meet every requirement for safe concrete construction.

In addition to reinforcing bars in rounds, squares and twisted, this concern is rolling the highest grade of bedstead angles.

Messrs. Woods & Huddart, the well known jobbers of iron and steel, who are also agents for structural steel, are the selling agents for Rudgear-Merle Company's steel bars and maintain a warehouse in San Francisco with a capacity for storing 2500 tons of material. Two of the illustrations accompanying this article show interior views of the rolling mill, the other three photographs give the reader an idea of Woods & Huddart's warehouse and fabricating department.

Physical tests made by the Bureau of Engineering, Department of Public Works of the City of San Francisco, of steel rolled by this firm, have been eminently satisfactory and fully up to the requirements of the most exacting conditions. According to experiments made by Engineer A. L. Bobbs of San Francisco, the Rudgear High Tensile steel will permit of a stress of 20,000 pounds to the square inch, while tests made by the United States Government, the Department of Public Works of the City of San Francisco and the Robert W. Hunt Company show some remarkable results for elastic limit, ultimate strength, bend, and per cent of elongation.

It may not be generally known that the Rudgear High Tensile bar is made from steel rails. A railroad rail is just about the best steel that anybody can make, conforming to the most rigid physical and chemical specifications, and accepted only after equally rigid physical and chemical inspection and test. Then, the years of use on the right of way, under the incessant hammering of heavy locomotives and cars, in all weathers, constitute a still severer test. And this continued use also "cold rolls" the steel into a still tougher, denser structure and physical fiber. Reheating and re-rolling still further improves the

Interior Rudgear-Merle Rolling Mill, showing Splendid Equipment for Manufacturing Steel Bars

Woods & Huddart Warehouse where Rudgear High Tensile Steel Bars are Stored for Immediate Delivery

Fabricating Department of Woods & Huddart Warehouse, San Francisco

This Photograph shows over 1500 Tons of Reinforcing Steel in Woods & Huddart's Warehouse

quality a fact well known to all steel workers. The net result is a tremendously strong, rigid .40 carbon steel that has no equal at any price for strength—with lightness—a steel peculiarly adapted to making concrete reinforcing bars and for any purpose where maximum resistance to both vertical and longitudinal stresses are combined with minimum weight of steel used.

Its elastic limit averages 50,000 pounds, as against 30,000 pounds for ordinary steel, and its ultimate or tensile strength at least 85,000 pounds, as against about 55,000 pounds for ordinary steel.

"The standard of value in steel reinforcing is the amount of tensile strength you get for the amount of money expended."

Reinforcing, therefore, should not be purchased on the basis of a ton price, but by the measure of its elastic limit in tension.

With Rudgear high tensile steel, therefore, it is possible to offer twice the amount of tensile strength of ordinary mild steel at the same price per pound, and as steel is placed in concrete to take up tensile stresses, it naturally follows that the higher the tensile value, the better it is suited to the contractor's purposes.

Exhaustive experiments have demonstrated that steel of high tensile strength renders great savings in concrete construction in comparison with the use of mild steel. You can use practically one-half the weight, at the same time having more strength, saving dead load of building and with a higher factor of safety. You also have the saving of one-half of your freight charges and labor installation.

To quote from the works of Prof. Arthur N. Talbot of the University of Illinois, and other high authorities as follows:

"Reinforcing as high as one and a half per cent for steel of thirty thousand pounds per square inch and one per cent for steel of fifty thousand pounds per square inch may be used without developing the full compression strength of the concrete."

To Keep a T-Square from Slipping

Place two rubber bands on the table of the T-square, one near the head and one at the other end, and it will remain in place when the board is at any ordinary angle. The wider the bands the better.

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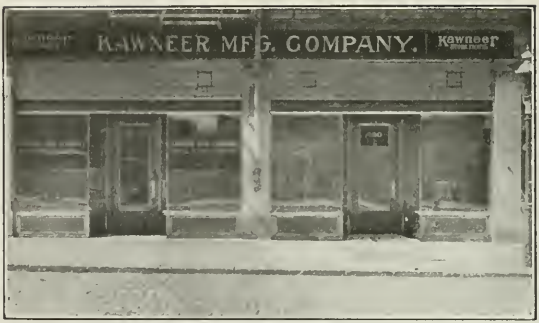

San Francisco Factory of Kawneer Mfg. Company
Note Simple but Tasty Store Fronts

Kawneer Store Fronts to be Manufactured in San Francisco

IT is an interesting and immensely gratifying announcement that Manager W. P. Fairbairn of the Kawneer Manufacturing Company of Niles, Mich., has asked The Architect and Engineer to make to its Pacific Coast readers this month.

So great has been the demand for the Kawneer store front goods, not only in San Francisco but in all the large Coast cities, including Los Angeles, Portland, Seattle and Spokane, that permanent branches have been established in each of these cities and San Francisco has been selected as a factory site. The ground floor and entire basement of the large brick building at 420-22 Turk street have been leased for a term of years and the place is now being fitted up as a factory, salesroom and office and in the future this will be the Company's distributing point for the Pacific Coast business.

Heretofore the company has been obliged to carry an enormous stock, especially of bars which come in a great many different sizes and angles, and the expense of maintaining this stock has been considerable. The San Francisco factory will carry a duplicate set of dies for which it will be possible to manufacture any of the metal and steel mouldings produced by the Eastern factory. This means the filling of all orders with promptness and it also means that architects on the Coast may now have the benefit of machinery that will turn out any style or type of store front work they desire, even to special designs in highly finished metal work.

Another line that will be given special attention will be architectural metal mouldings.

The local factory will enable the company to sell its store fronts at prices nearly one-half the old quotations, which means that the building public will now be able to get a standard product at prices lower than have heretofore been offered by any company. The reduced price is, of course, based largely upon the expectation that the volume of business will be very materially increased. A certain output must be guaranteed if the low prices are to be maintained.

Among the recent Kawneer installations in San Francisco may be mentioned the E. P. Charlton five and ten-cent store, the St. Francis Realty building at Mason and Turk streets, the Somer and Kaufmann store, the Paisley hotel, the Rucker building, the Dr. Wayland building on Post street, the Royal shoe store, the Cherry building, two store fronts for Barney Frankel and the Marion Leaventritt building.

It may not be generally known that Kawneer was the first—the original construction by which store front glass could be set directly between two metal bearing surfaces, without the assistance of putty, cork, wood or any other cushion substance. Every improvement made in store front construction since then is a product of Kawneer designers.

The Latest and Best in Wall Board Construction

IT has long been the aim of the modern architect and builder to combine safety with durability in the erection of the up-to-date factory, business block, or residence.

Many of the problems that have been stumbling blocks heretofore are solved by the valuable inventions of J. W. Voglesong, who was the first man to use wood fiber with plaster for interior work.

His early efforts in this direction have been greatly improved by later mechanical devices all novel and thoroughly protected by patents, that produce a wall-board which stands in a class by itself. California and the Pacific states are to have the benefit of Mr. Voglesong's effective methods as he is now in San Francisco as general manager of the Mound House Plaster Company, with a thoroughly equipped factory at Emeryville, where the machines invented by him have been installed. Here in a building which occupies the block on Hollis street at Forty-second, the very latest thing in plaster board is being produced. This is known as "California Colonial," and a visit to this establishment will well repay all practical men who are interested in a building product that possesses the dual attraction of maximum merit with a minimum of expense.

The Emeryville factory has a floor area of 250x100 feet and the machinery which reduces the wood to fiber, and combines it with fine gypsum plaster under air-pressure of over 50 tons each board, may be seen there in daily operation. Wall board is perhaps best known in the Eastern states where so extensive a concern as the Pittsburgh Plate Glass Company took up the manufacture under the patents and guidance of Mr. Voglesong several years ago, and installed factories for supplying these boards in Pennsylvania, Ohio, Illinois, Missouri, and other States. But the plant owned by the Mound House Plaster Company is far and away the best one of its kind, and already the wall board known as "California Colonial" has won its way by its merit and superiority over all other substitutes for the old lath-and-plaster form of construction.

Besides its novelty, which naturally gives it an attraction for contractors and architects, there is the stronger claim to recognition as a product which is not only labor-saving, but combines several of the latest improvements in building. Among these are fire-proofing, electric-insulating, sound-deadening and non-conduction of heat and cold, while the old processes of lathing and brown-coating are also provided for, or, more properly speaking, rendered unnecessary.

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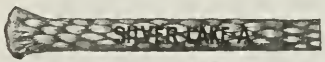

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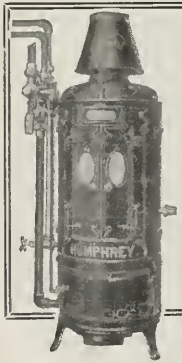

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In support of this claim for "California Colonial" wall board is the official report of the Underwriters' Laboratories in Chicago, representing the National Board of Fire Underwriters for the United States and Canada. The test was made on dry pine studding, and a temperature of 1,760 degrees Fahrenheit was reached during the 60 minutes the board was "under fire." After this severe trial the board was cooled with hose, the nozzle being twenty feet from the panel, and the official statement is that "the stream failed to displace any of the board on the chamber side, although directly exposed to the impact, nor did the boards or plaster show further cracking."

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The advancement in the manufacture of material that enters into the modern building has become so well known as to no longer incite unusual comment. The art of the metal worker has been adapted to the new opportunities afforded by this advancement. Metal doors and trim in certain types of buildings has now become imperative. To comply with this requirement and to provide the most artistic substitute for wood the Monarch Metal Manufacturing Company, of Kansas City, Mo., have designed and are manufacturing an artistic line of metallic doors and windows that are worthy of notice.

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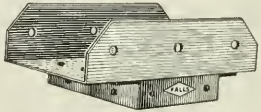

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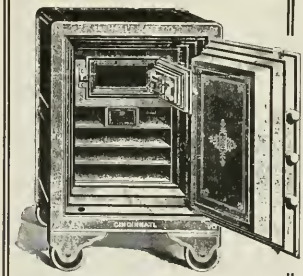

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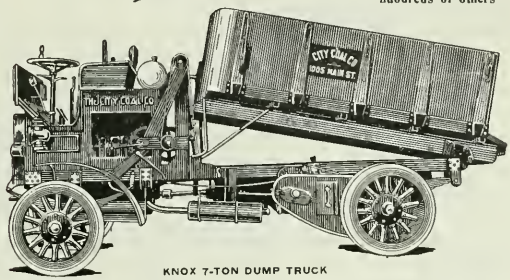

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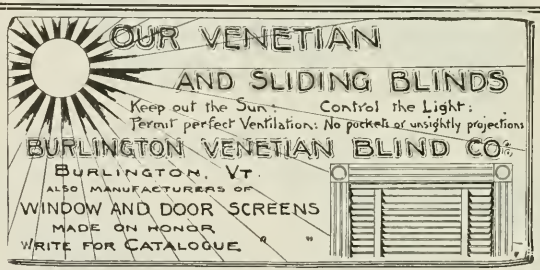

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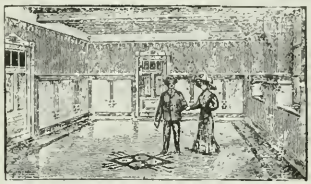

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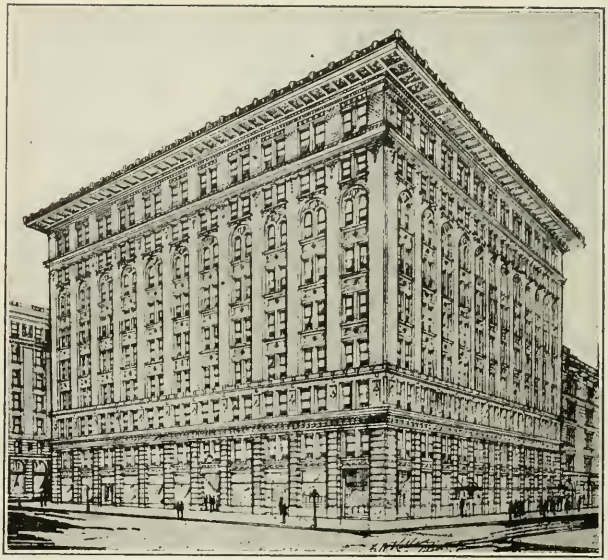

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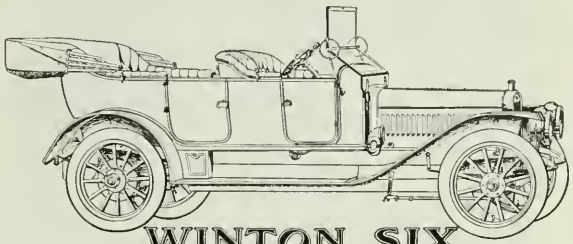

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These trailers usually adopt a new fashion only after the success of the original has been fully proved, and they think they are always on the safe side, since the public eagerly buys proved successes.

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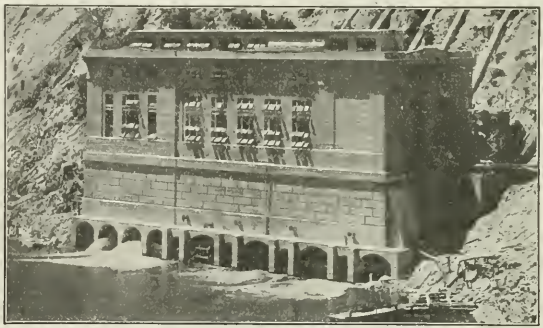

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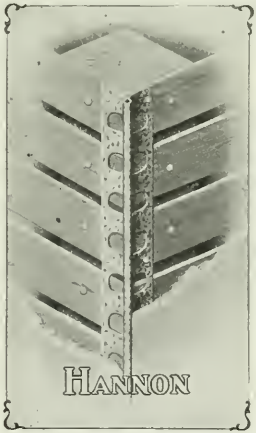

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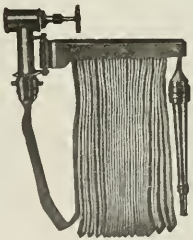

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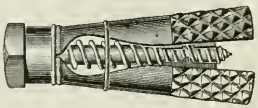

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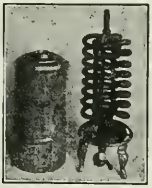

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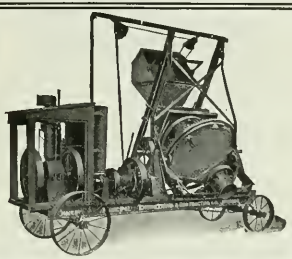

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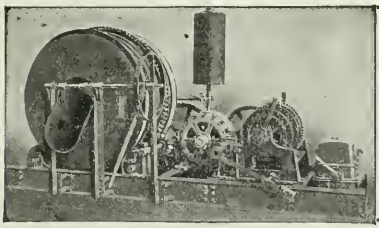

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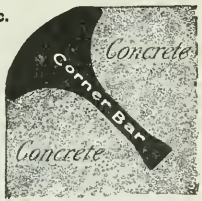

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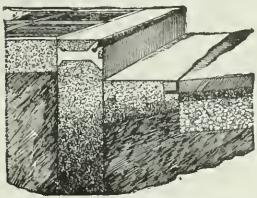

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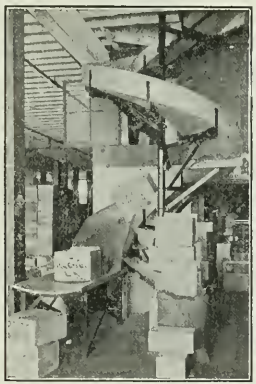

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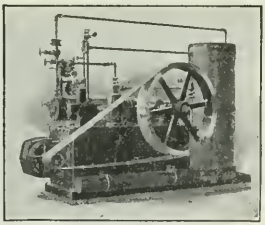

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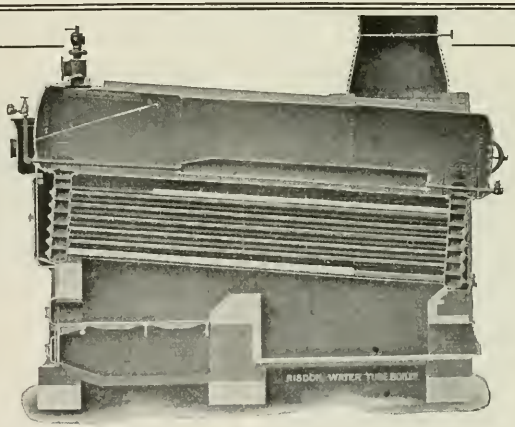

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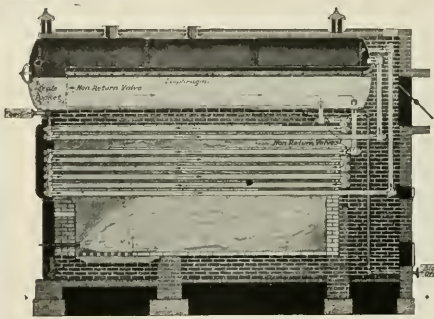

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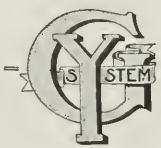

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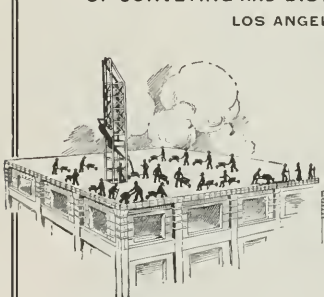

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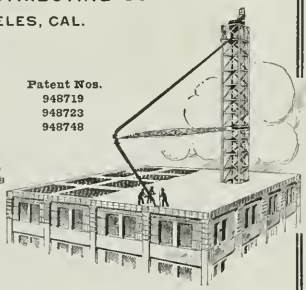

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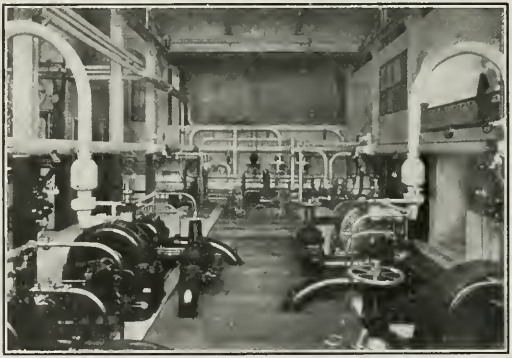

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CEMENT
Atlas Portland Cement Co., represented by Western Building Material Co., 430 California, St., S. F.
Building Material Co., The (Inc.) 583 Monadnock Bydg., S. F.
Boyd & Moore.....356 Market St., S. F.
J. P. Holland.....Army St. Wharf, S. F.
Pacific Portland Cement Co., Pacific Bldg., S. F.
Standard Portland Cement Co., and Santa Cruz Portland Cement Co. Crocker Bldg., S. F.
Strable Mfg. Co.....Oakland, Cal.
The Building Material Co., "Medusa White Portland" ....583 Monadnock Bldg., S. F.

CEMENT EXTERIOR WATERPROOF COATING
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. [See distributing Agents on page 139.] Boyd & Moore.....356 Market St., S. F.
Petrifax Cement Coating, sold in San Francisco by Sherman Kimball, 503 Market St.
"Kahn System," Trussed Concrete Company, Rialto Bldg., S. F.
Biturine Co. of America, 24 California St., S. F.

CEMENT EXTERIOR FINISH
The American Bitumastic Enamels Company, Hill, Hubbell & Co., Pacific Coast Agents, Fife Bldg., S. F.
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. [See list of distributing agents on page 139.]
Dexter Bros. Company, represented by Sherman, Kimball, Hooker & Lent Bldg. (503 Market St.), San Francisco.
Glidden's Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
"Wesco."—West Coast Kalsomine Co., 110 Hansford Bldg., S. F.
Buswell's Steel and Concrete Paints Oakland, Cal.
"La Farge," sold by Waterhouse & Price, 59 Third St., S. F.
Medusa White Portland Cement, California Agents, the Building Material Co., Inc., 587 Monadnock Bldg., S. F.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
WESCO—West Coast Kalsomine Co., 110 Hansford Bldg., S. F.

CEMENT EXTERIOR WATERPROOF COATING
The American Bitumastic Enamels Company, Hill, Hubbell & Co., Pacific Coast Agents, Fife Bldg., S. F.

CEMENT EXTERIOR WATERPROOFING
The American Bitumastic Enamels Company, Hill, Hubbell & Co., Pacific Coast Agents, Fife Bldg., S. F.
Glidden's Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.

CEMENT FLOOR COATING
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. [See list of distributing agents on page 139.]

CEMENT FLOOR COATING—Continued.
Dexter Bros., Sherman Kimball, Agent, 503 Market St., S. F.
Glidden's Concrete Floor Dressing, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.

CEMENT GUN
Lilly & Thurston Co., distributors for Northern California .....Rialto Bldg., S. F.

CEMENT TESTS
Smith, Emery & Co....651 Howard St., S. F.
Robert W. Hunt & Co., 418 Montgomery St., S. F.
R. E. Noble & Co., Humboldt Bank Bldg., S. F.

CHEMICAL ENGINEERS
Smith, Emery & Co., 651 Howard St., S. F.
Robert W. Hunt & Co., 418 Montgomery Street, San Francisco.
R. E. Noble & Co., Humboldt Bank Bldg., S. F.

CHURCH INTERIORS
Burlingame Cabinet Works, 509-511 Sixth Street, San Francisco.
Fink & Schindler.....218 13th St., S. F.

COLD STORAGE INSULATION
Neponset Waterdyke Felt and Compound manufactured by F. W. Bird & Son, East Walpole, Mass.; sold by Parrott & Co., 320 California St., S. F.

COMPOSITION FLOORING
Artolith Mfg. Company, 149 Turk St., S. F.

CONCRETE CONSTRUCTION
Esterly Construction Co.....Berkeley, Cal.
Foster Vogt Co....722 Hearst Bldg., S. F.
Petersen, H. L. .....62 Post St., S. F.
Ransome Concrete Company, 57 Post St., S. F.
Willis A. Clark & Co., 657 Monadnock Bldg., S. F.

CONCRETE MIXERS
Chicago Improved Cube Mixer. Pacific Coast Offices, 338 Brannan St., S. F., and F. T. Crowe & Co.....Portland and Seattle.
Foote Mixers sold by Langford, Bacon & Myers.....215 Rialto Bldg., S. F.
Ransome Mixers, sold by Norman B. Livermore & Co....Metropolis Bank Bldg., S. F.

CONCRETE PILES
Portland Concrete Pile & Equipment Co., Phelan Bldg., S. F.

CONCRETE POURING APPARATUS
Concrete Appliances Co., Los Angeles; Parrott & Co., Coast Representatives, San Francisco, Portland, Seattle.

CONCRETE REINFORCEMENT
Clinton Fireproofing System, L. A. Norris, Monadnock Bldg., S. F.
International Fabric & Cable, represented by Western Builders' Supply Co., 680 Mission St., S. F.
Plain and Twisted Bars, sold by Baker & Hamilton, San Francisco, Los Angeles and Sacramento.
Triangle Mesh Fabric, Sales Agents, The Lilley & Thurston Co....Rialto Bldg., S. F.
Twisted Bars, sold by Woods & Huddart, 444 Market St., S. F.

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457 MARKET STREET, PHONE SUTTER 1687.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CONCRETE SURFACING
"Alkacene" Liquid Concrete, Boyd & Moore, 356 Market St., S. F.
The American Bitumastic Enamels Company, Hill, Hubbell & Co., Pacific Coast Agents, Fife Bldg., S. F.
Buswell's Steel and Concrete Paints, Oakland, Cal.
"Concreta," sold by W. P. Fuller & Co., S. F.
Concreto, Worden-Meeker Varnish Co., S. F. and Oakland.
Glidden Liquid Cement, manufactured by Glidden Varnish Company, Whittier, Coburn Co., San Francisco and Los Angeles, Pacific Coast Distributors.
WESCO—West Coast Kalsomine Co., 110 Hansford Bldg., S. F.

CONSTRUCTION MATERIAL
Electric Appliance Co., 807 Mission St., S. F.

CONSTRUCTION MANAGERS
Geo. H. Stoffels Co., ...Pacific Bldg., S. F.

CONTRACTORS, GENERAL
Elam, Thos. & Son, Builders' Exchange, S. F.
Esterly Construction Co.....Berkeley, Cal.
F. O. Engstrum Co., East Fifth and Seaton Sts., Los Angeles.
Farrell & Reed.....Gunst Bldg., S. F.
Foster, Vogt Co.....722 Hearst Bldg., S. F.
Geo. H. Stoffels & Co., 830 Pacific Bldg., S. F.
Geo. W. Boxton.....Hearst Bldg., S. F.
Grant Fee.....2440 16th St., S. F.
Harvey A. Klyce.. ..Monadnock Bldg., S. F.
Hoyt Bros., Monadnock Bldg., S. F., and Santa Rosa
McLaren & Peterson, 706-707 Williams Bldg., S. F.
C. P. Moore Building Co., Monadnock Bldg., S. F.
Locke Construction Company, Crocker Bldg., S. F.
William H. Henning..Examiner Bldg., S. F.
Ransome Concrete Co., Mechanics Institute Bldg., S. F.
Rickon-Ehrbart Eng. & Const. Co., 1859 Geary St., S. F.
Robert Trost...26th and Howard Sts., S. F.
Patrick-Nelson Building Co., 2025 Addison St., Berkeley.
Peterson & Wilson.....1113 Post St., S. F.
Wm. Bateman.....1915 Bryant St., S. F.
Williams Bros. & Henderson, 351 Monadnock Bldg., S. F.
Willis A. Clark & Co., Monadnock Bldg., S. F.

CORNER BEAD
Hunt Metal Corner Co., 201 Devonshire St., Boston, Mass.
"Prescott," sold by Boyd & Moore, 356 Market St., S. F.
Union Metal Corner Company, 144 Pearl St., Boston, represented on the Pacific Coast by Waterhouse & Price.

CRUSHED ROCK
Natomas Consolidated of California,
Peoples Savings Bank Bldg., Sacramento, Cal.
Niles Rock, sold by California Building Material Company.....Pacific Bldg., S. F.
J. P. Holland.....Army St. Wharf, S. F. Phone Mission 5466.
Van Sant-Houghton Co., 503 Market St., S. F.

CORK TILING
Nonpareil Cork Tiling, David E. Kennedy, Inc., N. Y. Pacific Coast office, Phelan Building, S. F., G. H. Freear, Mgr.

DAMP-PROOFING COMPOUND
The American Bitumastic Enamels Company, Hill, Hubbell & Co., Pacific Coast Agents, Fife Bldg., S. F.
Biturine Co. of America, 24 California St., S. F.
Boyd & Moore.....356 Market St., S. F.
Glidden's Liquid Rubber, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
"Pabco" Damp Proofing Compound, sold by Paraffine Paint Co.....34 First St., S. F.
Parrott & Co., agents for Genasco Positive Seal Damp Proof Paint.
"Protectorine," Compound, sold by Boyd & Moore.....356 Market St., S. F.
H. D. Samuel Co....Monadnock Bldg., S. F.
WESCO—West Coast Kalsomine Co., 110 Hansford Bldg., S. F.

DOORS—FREIGHT ELEVATOR
"Cross" Counterbalance Automatic, Boyd & Moore, Agents.....356 Market St., S. F.

DOOR HANGERS
Pitcher Hanger, sold by Pacific Tank Company.....231 Berry St., S. F.
Reliance Hanger, sold by Sartorius Co., S. F.; D. F. Fryer & Co., Louis R. Bedell, Los Angeles, and Portland Wire & Iron Works.

DOOR OPENER
G. Rischmuller, Builders' Ex., and 3442 19th St., S. F.

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ARCHITECTS' SPECIFICATION INDEX *Continued*

DOORS—DISAPPEARING
Pacific Tank & Pipe Co.,
231 Berry St., S. F.

DOORS—SCREEN
Higgin Mfg. Co., represented by Mailler Searles.....817 Monadnock Bldg., S. F.

DOORS AND SHUTTERS
Kinnear Steel Rolling Doors and Shutters, Lilley & Thurston Co., Rialto Bldg., S. F.

DOORS—WAREHOUSE
"Cross" Horizontal Folding Doors, Boyd & Moore, Agents.....356 Market St., S. F.
Wells & Spencer Machine Company,
173 Beale St., S. F.

DUMB WAITERS
Energy Dumb Waiters, Boyd & Moore, Agents.....356 Market St., S. F.

ELECTRICAL CONTRACTORS
Butte Engineering Co..683 Howard St., S. F.
Central Electric Co..185 Stevenson St., S. F.
Davis & Doman Electric Co.,
1220 Webster St., S. F.
Electric Appliance Co., 807 Mission St., S. F.
Jno. G. Sutton Co.....243 Minna St., S. F.
Pacific Fire Extinguisher Company,
507 Montgomery St., S. F.

ELEVATORS
Otis Elevator Company,
Stockton and North Point, S. F.
Van Emon Elevator Co..54 Natoma St., S. F.
Wells & Spencer Machine Co.,
173 Beale St., S. F.

ELEVATOR CARS
Cleveland Art Metal Co., Boyd & Moore, Agents .....356 Market St., S. F.

ELEVATOR DOORS
"Cross" Elevator Doors, Boyd & Moore, Inc., Agents.....356 Market St., S. F.
Dahlstrom Metallic Door Co.,
Rialto Bldg., S. F.

ELEVATORS, SIGNALS, FLASHLIGHTS AND DIAL INDICATORS
Elevator Supply & Repair Co.,
593 Market St., S. F.

ENGINEERS
F. J. Amweg.....700 Marston Bldg., S. F.
W. W. Breite.....Clunie Bldg., S. F.
Hunter & Hudson, Monadnock Bldg., S. F.
Rickon & Ehrhart, 1859 Geary St., S. F.
Van Sant-Houghton Co.,
503 Market St., S. F.

EXPRESS CALL SYSTEM
Elevator Supply & Repair Co.,
593 Market St., S. F.

FIRE ESCAPES
Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, etc. Phone Market 1374; Home, J 3435..370-84 Tenth St., S. F.

FIRE EXTINGUISHERS
Marshall & Schimpf.....Clunie Bldg., S. F.
Pacific Fire Extinguisher Co.,
507 Montgomery St., S. F.

FIREPLACE DAMPER
Head, Throat and Damper for open fireplaces, Colonial Fireplace Co., Chicago.
(See advertisement for Coast agencies.)

FIREPROOFING
Gladding, McBean & Company,
Crocker Bldg., S. F.
Los Angeles Pressed Brick Co.,
Frost Bldg., L. A.
Roebling Construction Co., Crocker Bldg., S. F.

FIRE PROTECTION—SPRINKLER SYSTEM
Jno. G. Sutton Co.....243 Minna St., S. F.
Pacific Fire Extinguisher Company, 507 Montgomery St., San Francisco; Branch Offices, Portland, Seattle and Spokane.
Marshall & Schimpf.....Clunie Bldg., S. F.

FIXTURES—BANK, OFFICE, STORE, ETC.
Burlingame Cabinet Works,
509-511 Sixth Street, San Francisco
A. J. Forbes & Son..1530 Filbert St., S. F.
Fink & Schindler.....218 13th St., S. F.
T. H. Meek Company..1157 Mission St., S. F.
C. F. Weber & Co., 365 Market St., San Francisco and 210 N. Main St., Los Angeles, Cal.

FLOOR TILING
Watson Mantel & Tile Co.,
457 Market St., S. F.

FLOORS—CORK
Nonpariel Cork Tiling, David E. Kennedy, Inc., N. Y. Distributor for the Pacific Coast, G. H. Freear, Phelan Building, S. F.

FLOOR VARNISH
Bass-Hueter and S. F. Pioneer Varnish Works,
816 Mission St., S. F.
R. N. Nason & Co...151 Potrero Ave., S. F.
Standard Varnish Works,
Chicago, New York and S. F.
Worden-Meeker Varnish Works,
S. F. and Oakland

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit,
Bowser & Co. .....612 Howard St., S. F.

GARBAGE BURNERS
Water Heating Garbage Burners, sold by Cal. Hydraulic Eng. & Supply Co.,
70 Fremont St., S. F.

GARBAGE CHUTE
Bill & Jacobsen.....524 Pine St., S. F.

GLASS AND GLAZING
California Plate and Window Glass Company,
864 Mission St., San Francisco.
W. P. Fuller & Co.,
San Francisco, Los Angeles and Portland.

GRAPHITE
Detroit Graphite Co..301 Hearst St., S. F.

GRAVEL, SAND AND CRUSHED ROCK
Bay Development Co.....153 Berry St., S. F.
California Building Material Co.,
Pacific Bldg., S. F.
Del Monte White Sand, sold by Pacific Improvement Co.....Crocker Bldg., S. F.
Grant Gravel Co.....87 Third St., S. F.
J. F. Holland.....Army St. Wharf, S. F.
Phone Mission 5466.
Natomas Consolidated.
Peoples' Savings Bank Bldg., Sacramento

HARD WALL PLASTER
Empire Hard Wall Plaster, sold by Pacific-Portland Cement Co., Pacific Bldg., S. F.
Reno Hard Wall Plaster, sold by Western Building Material Co.,
430 California St., S. F.

HARDWARE
Russwin Hardware, Joost Bros., S. F.

HARDWOOD FLOORING
Boyd & Moore.....356 Market St., S. F.
Dieckmann Hardwood Co.,
244 California St., S. F.
E. A. Howard & Co., 20 Howard St., S. F.
Strable Mfg. Co.....Oakland, Cal.
Parrott & Co.....320 California St., S. F.
White Bros., Cor. Fifth and Brannan Sts., S. F.
Hardwood Interior Company,
554 Bryant St., S. F.

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FIBRESTONE & ROOFING CO. ...Succeeding... FORD & MALOTT
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TELEPHONES: KEARNY 664
HOME J 1124

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HARDWOOD LUMBER
Dieckmann Hardwood Co., Welch Bldg., S. F.
Parrott & Co.....320 California St., S. F.
Strable Mfg. Co.,
First St., betw. Washington & Clay, Oakland.
White Bros., Cor. Fifth and Brannan Sts., S. F.
HARDWOOD VENEER PANELS AND DOORS
E. A. Howard & Co....Howard St., S. F.
HEATERS—AUTOMATIC
Hoffman Heater, sold by Holbrook, Merrill & Stetson, San Francisco and Los Angeles.
Humphrey Co.,
565 N. Rose St., Kalamazoo, Mich.
Pittsburg Water Heater, sold by Thos. Thieben & Co. .....667 Mission St., S. F.
HEATING EQUIPMENT—VACUUM, ETC.
C. A. Dunham Co., Marshalltown, Iowa, Western Division Office,
Monadnock Bldg., S. F.
Guernsey & Wheeler, ...Rialto Bldg., S. F.
Marshall & Schimpf.....Clunie Bldg., S. F.
HEATING AND VENTILATING
Atlas Heating & Ventilating Co.,
Fourth and Freelon Sts. San Francisco.
Fess System Co.....220 Natoma St., S. F.
Guernsey & Wheeler....Rialto Bldg., S. F.
Gilley-Schmid Co., Inc.,
Thirteenth and Mission Sts., S. F.
Hoffman & Meusser,
1129-1131 Howard St., San Francisco.
Mangrum & Otter, Inc., 507 Mission St., S. F.
H. W. Moffat, ...Pacific Bldg., S. F.
Royal Heating Co....280-82 Minna St., S. F.
Jno. G. Sutton Co....243 Minna St., S. F.
Pacific Blower & Heating Co.,
17th St., betw. Mission and Valencia, S. F.
Pacific Fire Extinguisher Company,
507 Montgomery St., S. F.
Petersen-James Co....710 Larkin St., S. F.
HINGES
Stanley's Ball-Bearing Hinges, Stanley Co.,
New Britain, Conn.
HOTELS
The Angelus, Loomis Bros.....Los Angeles
ICE MAKING MACHINES
"The Wizard," sold by the De Laval Dairy Supply Co., Drumm and Sacramento streets, San Francisco.
INGOT IRON
California Corrugated Culvert Co.,
5th and Parker Sts., West Berkeley.
American Rolling Mill Co.,
Middleton, Ohio.
INLAID FLOORS
Hardwood Interior Co., 554 Bryant St., S. F.
INSPECTIONS AND TESTS
Robert W. Hunt & Co.,
418 Montgomery St., S. F.
Smith, Emery & Co. Inc.,
651 Howard St., S. F.
R. E. Noble & Co., Humboldt Bank Bldg., S. F.
INSULATING MATERIALS
Armstrong Cork Co..... Pittsburg, Pa.
INSURANCE
David Duncan.....340 Sansome St., S. F.
INTERIOR DECORATING
The Tozer Company, 228 Grant Ave., S. F.
JOIST HANGERS
Western Builders' Supply Co.,
680 Mission St., S. F.
KITCHEN EQUIPMENT
John G. Ils & Co....855 Mission St., S. F.
LANDSCAPE ENGINEERS
MacRorie & McLaren Co.,
Westbank Bldg., S. F.
LIME
I. P. Holland.....Army St. Wharf, S. F.
Holmes Lime Company,
Monadnock Bldg., S. F.
LIGHTING FIXTURES
Adams & Hollopeter....745 Mission St., S. F.
Bauer Fixture Company,
126-130 Jones St., S. F.
LIGHT, HEAT AND POWER
Pacific Gas & Electric Co.,
445 Sutter St., S. F.
LOCKERS—METAL
Hart & Cooley Co., Boyd & Moore, Agents,
356 Market St., S. F.
LUMBER
Sunset Lumber So.....Oakland, Cal.
Santa Fe Lumber Co.,
Seventeenth and De Haro Sts., S. F.
MANTELS
Mangrum & Otter ....561 Mission St., S. F.
S. Ginsberg & Co.....1029 Larkin St., S. F.
Watson Mantel & Tile Co.,
457 Market St., S. F.
Thos. F. Rigney, ...9 City Hall Ave., S. F.
MARBLE
Columbia Marble Co...268 Market St., S. F.
METAL AND STEEL LATH
Baker & Hamilton, 433 Brannan St., S. F.
Roebling Construction Co.,
Crocker Bldg., S. F.
L. A. Norris & Co., Monadnock Bldg., S. F.
METAL CEILINGS
Berger Mnfg. Co....1120 Mission St., S. F.
San Francisco Metal Stamping & Corrugating Co.....Treat Ave. and 19th St., S. F.
METAL DOORS AND WINDOWS
Capitol Sheet Metal Works,
1927 Market St., S. F.
Dahlstrom Metallic Door Co., Western office,
Rialto Bldg., S. F.
S. Ginsberg & Co., 1029 Larkin St., S. F.
Metal Window Screens Mailler Searles, Agt.,
817 Monadnock Bldg., S. F.
Rufeson Metal Window Works,
Eighth and Brannan Sts., San Francisco.
Waterhouse & Price.....59 Third St., S. F.
Fink & Schindler Co., 218 13th St., S. F.
Zahner's Monarch Hollow Metal Doors and Trim, Boyd & Moore, Inc. Agents,
356 Market St., S. F.

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School Desks

ARCHITECTS' SPECIFICATION INDEX—*Continued*

METAL SHINGLES
Meurer Bros., J. A. McDonald, Pacific Coast Agent.....Third, near Townsend St., S. F.
San Francisco Metal Stamping & Corrugating Co.....Treat Ave. and 19th St., S. F.
L. B. Hooker Co., 1530 Howard St., S. F.

MIXERS
Enterprise Foundry Co., 200 2d St., S. F.

OPERA CHAIRS
C. F. Weber & Co....365 Market St., S. F.
Whitaker & Ray-Wiggin Co., San Francisco and Los Angeles.

ORNAMENTAL IRON AND BRONZE
J. G. Braun.....Chicago and New York
California Artistic Metal and Wire Company, San Francisco.
Standard Company, represented by Mailler Searles.....817 Monadnock Bldg., S. F.
Standard Iron Works, 235-39 Shipley St,. S. F.
Golden Gate Structural & Ornamental Iron Works .....1479 Mission St., S. F.
C. J. Hillard Company, Inc., 211-215 8th St., S. F.
West Coast Wire & Iron Works, 861-863 Howard St., S. F.

PAINT FOR STEEL STRUCTURES
The American Bitumastic Enamels Company, Hill, Hubbell & Co., Pacific Coast Agents, Fife Bldg., S. F.
Buswell's Steel and Concrete Paints, Oakland, Cal.
Detroit Superior Graphite Paint, manufactured by Detroit Graphite Company. C. W. Pike Company, Coast Sales Agents, 22 Battery St., S. F.
Glidden's Acid Proof Coating, sold on Pacific Coast by Whittier, Coburn Company, San Fraocisco and Los Angeles.

PAINT FOR CEMENT
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.), [See adv. in this issue for Pacific Coast agents.]
Glidden's Liquid Cement, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
The American Bitumastic Enamels Company, Hill, Hubbell & Co., Pacific Coast Agents, Fife Bldg., S. F.
Vitrolite Cold Water Paint, sold by Boyd & Moore.....356 Market St., S. F.
WESCO—West Coast Kalsomine Co., 110 Hansford Bldg., S. F.
Worden-Meeker Varnish Co., S. F. & Oakland.

PAINTS, OILS, ETC.
Bass-Hueter Paint Company, Mission, near Fourth St., S. F.
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.

PAINTS, OILS, ETC.—Continued.
Glidden Varnish Co., Cleveland, Ohio, represented by Whittier-Coburn Co., S. F. and Los Angeles
R. N. Nason Company.....San Francisco
Paraffine Paint Co....38-40 First St., S. F.
Standard Varnish Works, represented by W. P. Fuller & Co., S. F. and Los Angeles.
Wesco—West Coast Kalsomine Co., 110 Hansford Bldg., S. F.
Worden-Meeker Varnish Co., S. F. & Oakland.

PHOTO ENGRAVING
California Photo Engraving Co., 121 Second St., S. F.

PHOTOGRPHY
Gabriel Moulin.....153 Kearny St., S. F.

PIPE—CORRUGATED INGOT IRON
California Corrugated Culvert Company, Los Angeles and West Berkeley.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA.
N. Clark & Sons, 112 Natoma St., San Francisco
Gladding McBean & Co., Crocker Bldg., S. F.
Pacific Sewer Pipe Company, I. W. Hellman Bldg., Los Angeles
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.

PLASTER
Empire Plaster, The Nevada Gypsum Co., Pacific Bldg., S. F.

PLASTER WALL BOARD AND WOOD FIBRE
Mound House Plaster Co., Monadnock Bldg., S. F.

PLASTERING CONTRACTORS
D. Ross Clarke.....708 Pacific Bldg., S. F.

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Jno. G. Sutton Co.....243 Minna St., S. F.
Peterson-James Co....710 Larkin St., S. F.
The J. Looney Company, 85 City Hall Ave., San Francisco
Wetzel & Grass.....105 Fulton St., S. F.
Wittman, Lyman & Co., 315 Polk St., S. F.

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Jno. Douglas Co....571 Mission St., S. F.
Haines, Jones & Cadbury Co., 851-859 Folsom St., S. F.
P. F. Howard Co., Second and Folsom Sts., S. F.
Louis Lipp Company, Winton Place, Ohio. Pacific Coast Office, 693 Mission St., S. F.
Mark-Lally Co..First and Folsom Sts., S. F.
J. L. Mott Iron Works, D. H. Gulick, selling agent .....135 Kearny St., S. F.
N. O. Nelson Mfg. Co., 978 Howard St., S. F 406 E. 4th St., Los Angeles
Geo. H. Tay Company, 617 Missioo St., S. F

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C. A. Dunham Co., Monadnock Bldg., S. F.

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Iroquois Iron Works (Barber Asphalt Company) .....Head Bldg., S. F.

RAILROADS
Southern Pacific Co.....Flood Bldg., S. F.
Western Pacific Railroad, Mills Bldg., S. F.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
Lilley & Thurston Co., Rialto Bldg., S. F.
C. F. Weber & Co.....365 Market St., S. F.

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Fibrestone & Roofing Co., Mutual Savings Bank Bldg., S. F.
Genasco Ready Roofing, sold by Parrott & Co.....320 California St., S. F.
Mackenzie Roof Co., 425 15th St., Oakland.
Meurer Bros. Co., A. H. McDonald, Coast Representative.....630 Third St., S. F.
H. D. Samuel Company, 1054 Monadnock Bldg., S. F.
United Materials Co.... Balboa Bldg., S. F.
Western Builders' Supply Co., 680 Mission St., S. F.

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N. & G. Taylor Co.....Philadelphia, Pa.
J. A. Drummond, 422 Chronicle Bldg., S. F.

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New York Belting & Packing Co., 129 First St., S. F.

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Howe Scale Company, 333 Market St., S. F.

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Del Monte White Sand, sold by Pacific Improvement Company, Crocker Bldg., S. F.
J. P. Holland.....Army St. Wharf, S. F.

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Sacramento Sandstone Brick Co., 39 Stevenson St., S. F.

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Silver Lake A Sash Cord, represented by Sanford Plummer, 149 New Montgomery St., S. F.

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Berger Mfg. Co.....1120 Mission St., S. F.
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Dunlevy & Gettle....79 City Hall Ave., S. F.
Hibernia Sheet Metal Works, 219 Seventh St., S. F.
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Union Iron Works..... San Francisco
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Vacuna Sales Company, Mailler Searles, Agent.....817 Monadnock Bldg., S. F.

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Ericsson Swedish Venetian Blinds, Boyd & Moore, Inc., Agents..356 Market St., S. F.

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White Bros., Cor. Fifth and Brannan Sts., S. F.

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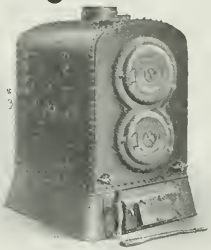

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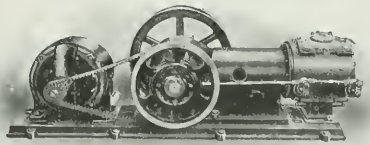

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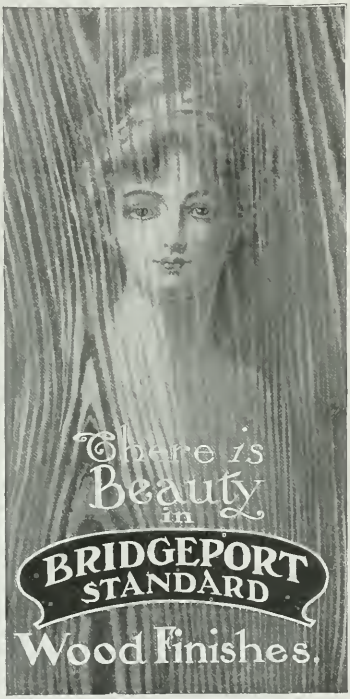

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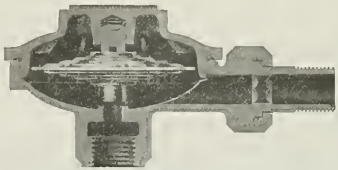

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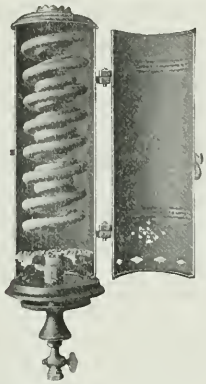

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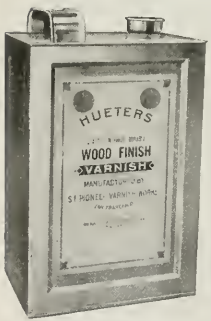

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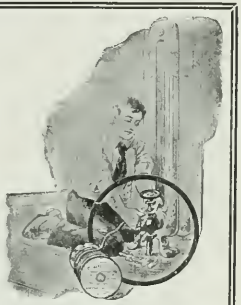

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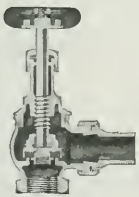

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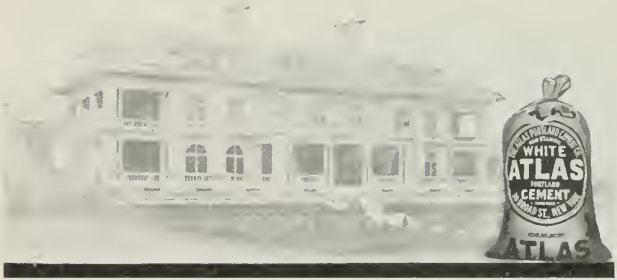

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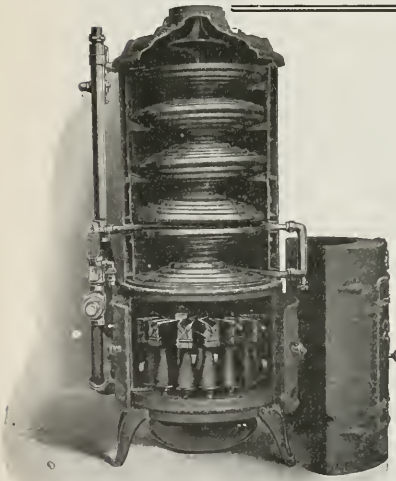

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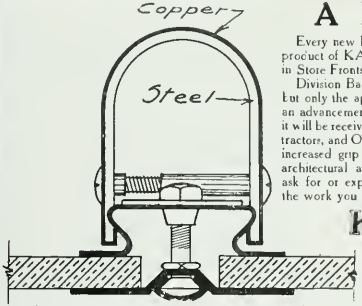

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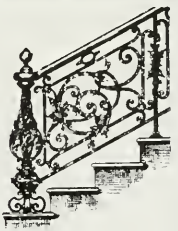

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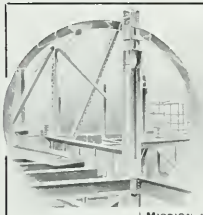

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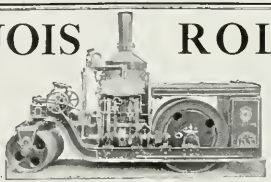

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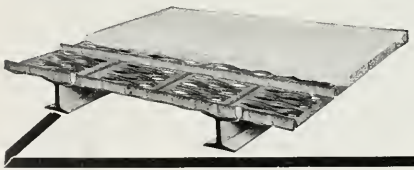

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Pacific Coast States

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C. A. MEUSSDORFFER, Architect

Frontispiece
The Architect and Engineer
June, 1912

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THE
Architect and Engineer
Of California
Pacific Coast States

VOL. XXIX. JUNE, 1912. No. 2.

Home of C. A. Meussdorffer, Ross, Marin County, Cal.

Some Recent Work of C. A. Meussdorffer, Architect

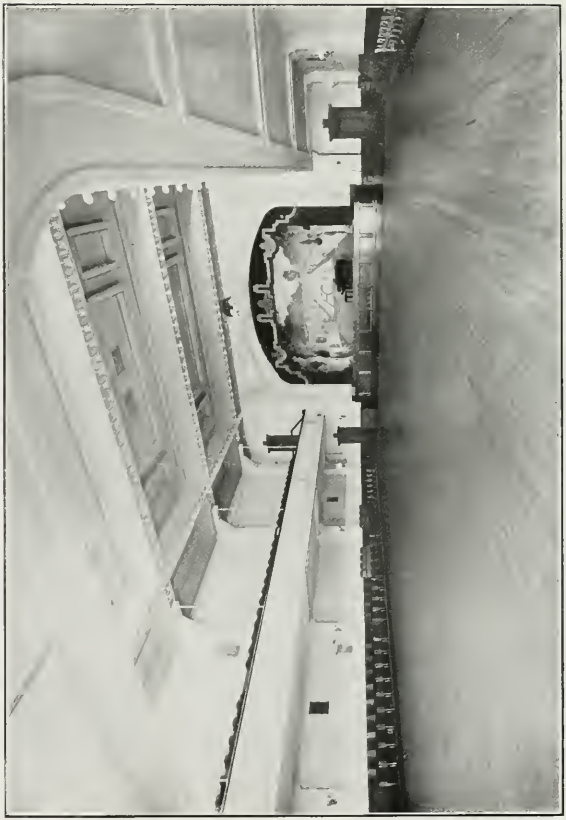
MR. C. A. Meussdorffer, to whose work this number of The Architect and Engineer has been dedicated, has practiced architecture very successfully in San Francisco for the past fifteen years. While most of his buildings were destroyed by the great conflagration of 1906 we are enabled to show some creditable work done since that memorable event.

As with the majority of young architects who are obliged to "carve their own way" his first opportunities were offered in designing modest flats and dwellings and it is interesting to trace the development and wide scope of subsequent work embracing almost every type of building.

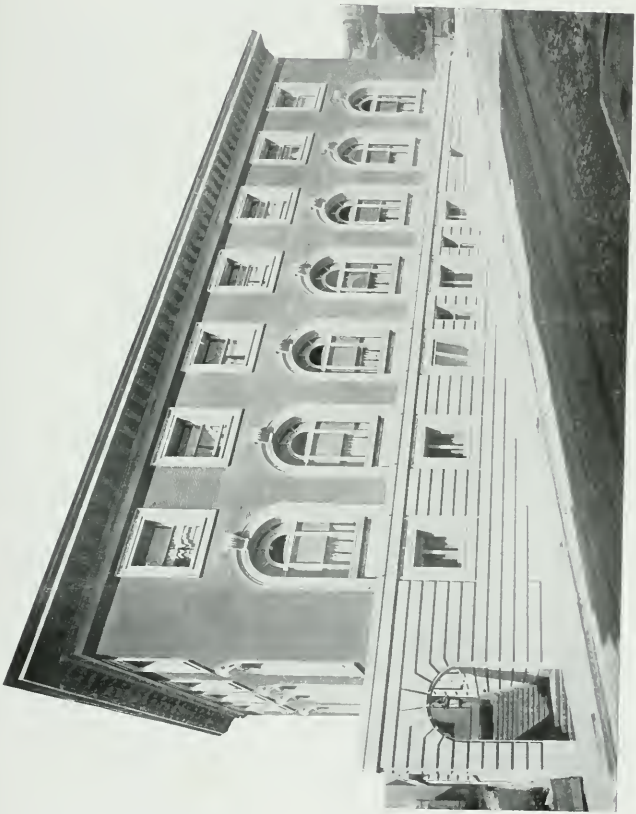
During the past two years Mr. Meussdorffer has specialized in Club Houses, among them being the "Family," "Holluschickie," "Southern"

Club House, Fraternal Order of Eagles, San Francisco
C. A. Meussdorffer, Architect

Lodge Room, Showing Art Glass Dome — Fraternal Order of Eagles, San Francisco
C. A. Meussdorffer, Architect



Auditorium, Eagles Hall Building, San Francisco
C. A. Menzdorffer, Architect



Building for the Family Club, San Francisco
C. A. Meussdorffer, Architect

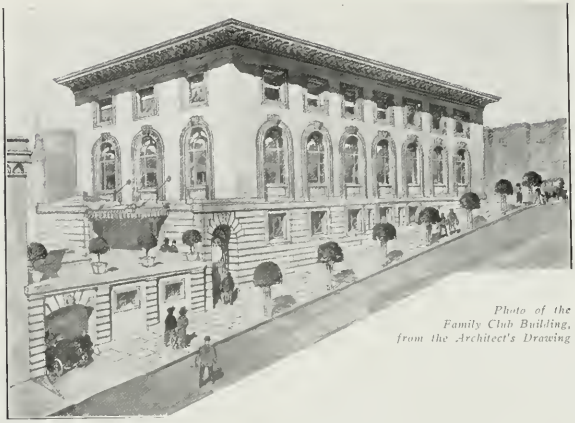
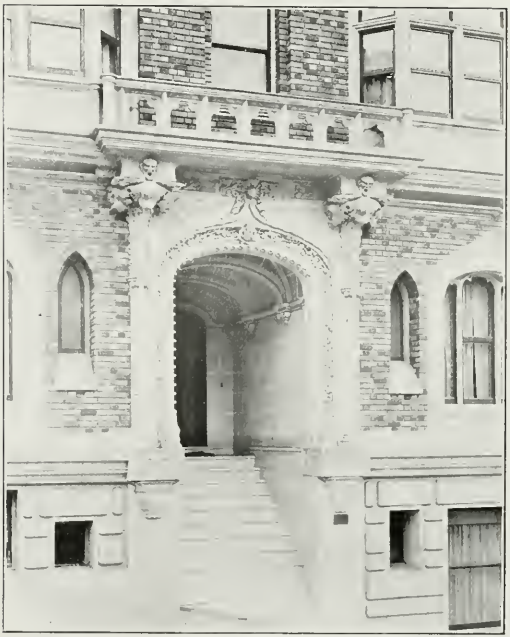


Photo of the Family Club Building, from the Architect's Drawing

Hollenbeckite Club Building, San Francisco
C. A. Meussdorffer, Architect



Entrance to Hollaschacke Club, San Francisco
C. A. Meussdorffer, Architect

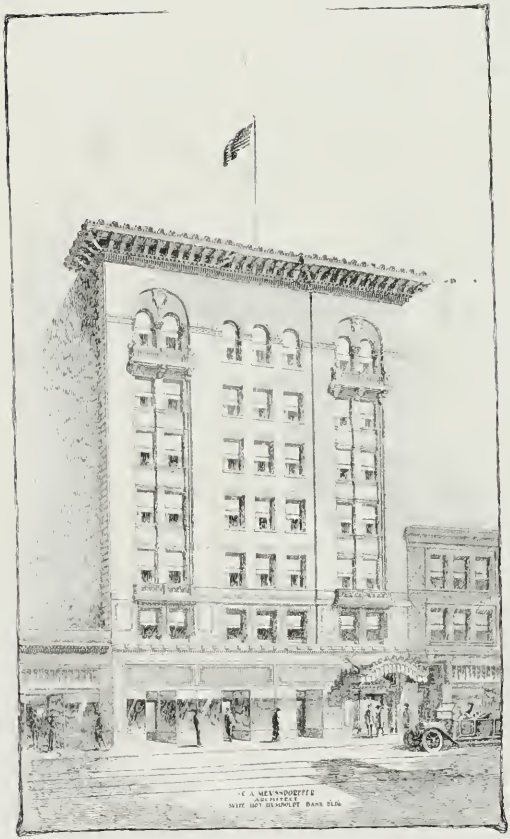
and the imposing home of the local order of Eagles for which he was awarded the first prize in competition with four other selected architects.

The Southern Club building now nearing completion on the brow of Nob Hill, is designed both externally and internally on the lines of the famous old southern colonial mansions and will recall to its members the memories of the magnificent old homesteads of "before the war"; with its simple, quaint and refined interior finish; its sweeping old fashioned stairway, terminating at its base with that typically southern spiral stair rail.

The great massive entrance portico and balconies overlook a large lawn where it is proposed to have for its central feature a monument to Gen. Robert E. Lee.

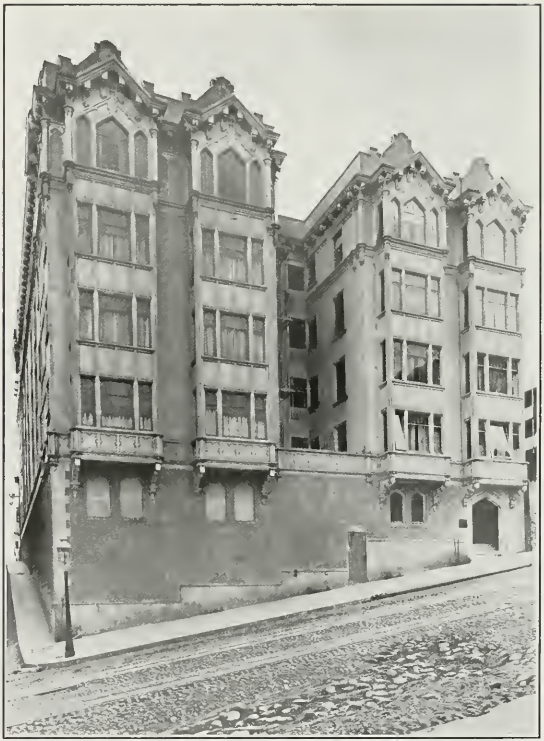
The arrangement of the interior is rather unique, the commanding position of this building giving a sweeping view of the bay and five counties, from the Golden Gate to San Jose, inspired its architect to place the general club rooms on the top floor with the dining and lounging rooms opening onto the portico roof, and the sleeping rooms on the floors below.

Riverside Apartments. Rivers Bros., Owners. San Francisco
C. A. Meussdorffer, Architect



Building for Mr. Edw. H. Mitchell, San Francisco
C. A. Meussdorffer, Architect

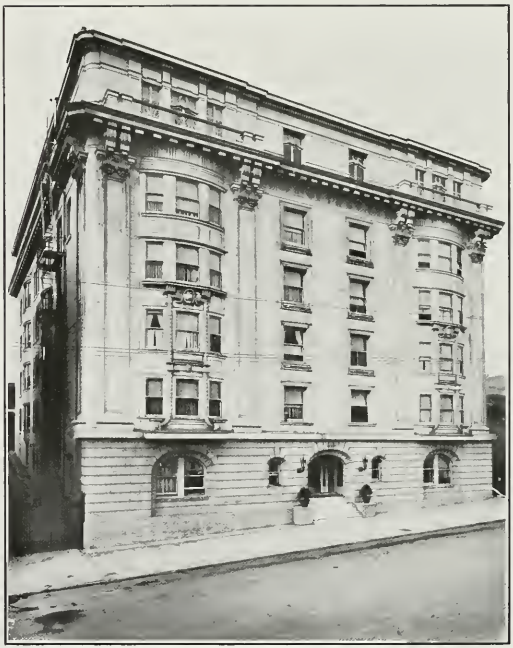
The Lafayette Apartments, San Francisco, Nat. C. Goodwin, Owner
C. A. Meussdorffer, Architect



Arcona Apartments, San Francisco
C. A. Meussdorffer, Architect

San Francisco Home of the
American Ever Ready Company
C. A. Meussdorffer, Architect

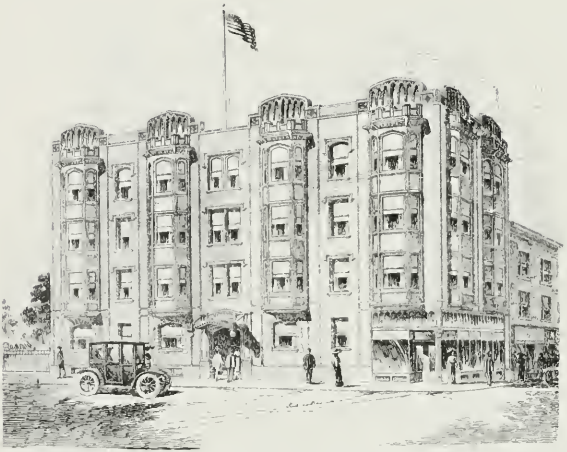
Lobby of the Arcona Apartments
San Francisco
C. A. Meussdorffer, Architect



St. Regis Apartments, San Francisco
C. A. Meussdorffer, Architect

R. B. Kellogg Apartments, San Francisco
C. A. Meussdorffer, Architect

Empress Apartments, San Francisco
C. A. Meussdorffer, Architect

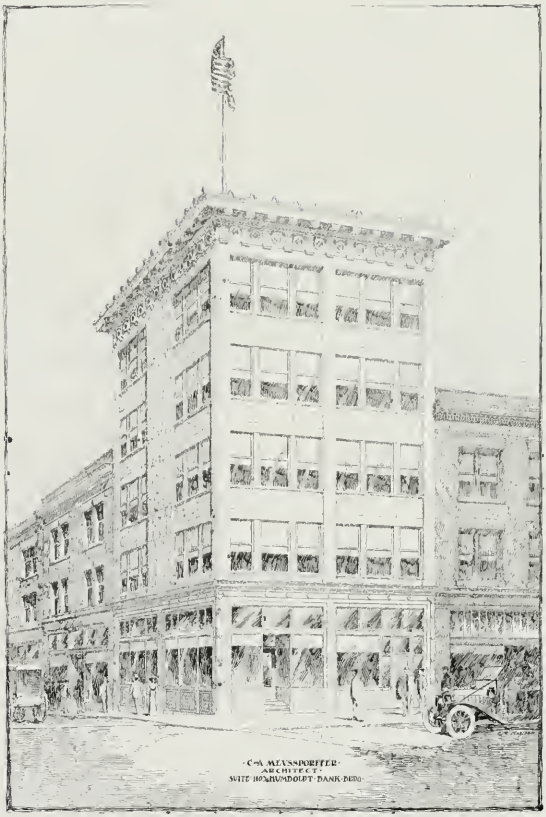


Stelling & Horstman Apartments, San Francisco
C. A. Meussdorffer, Architect

Glasgow Apartments, San Francisco
C. A. Meussdorffer, Architect *Mill work by Taylor & Co.*

Carmelita Apartments, Estate of David Werner, Owner
C. A. Meussdorffer, Architect

Rivers Bros'. Building, San Francisco
C. A. Meussdorffer, Architect



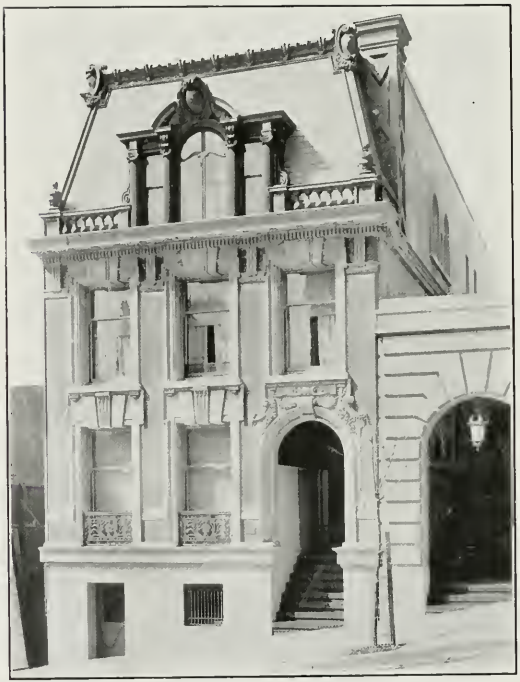
Building for the California Demokrat, San Francisco
C. A. Meussdorffer, Architect

Portuguese American Bank, Designed to Carry Additional Stories, San Fran[illegible]
C. A. Meussdorffer, Architect

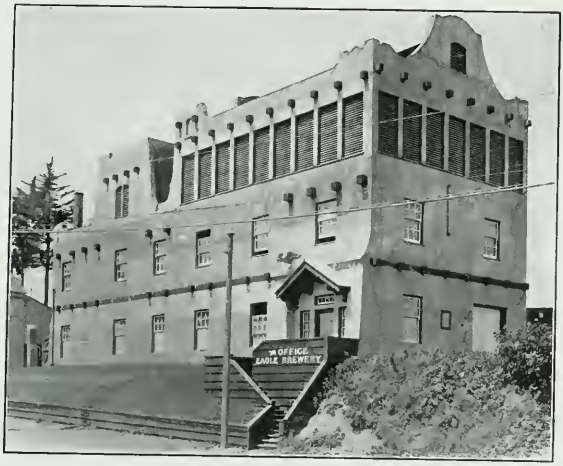
Ross School, Marin County, Cal.
C. A. Meussdorffer, Architect

[illegible] Building, San Francisco
[illegible] Architect

Hotel for Mr. A. W. Wilson, San Francisco
C. A. Meussdorffer, Architect.

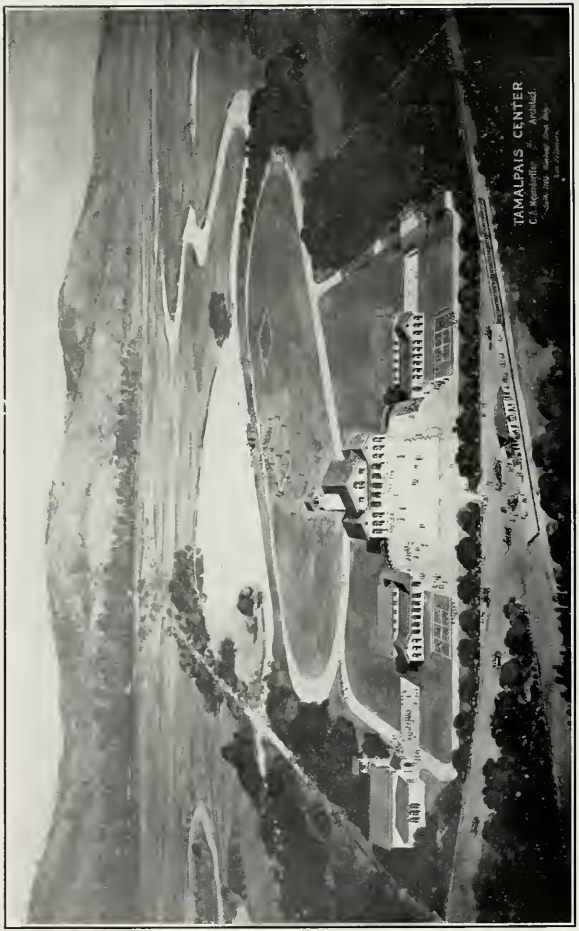


House of Mr. Geo. M. Perine, San Francisco
C. A. Meussdorffer, Architect



Building of the Eagle Brewery, San Francisco
C. A. Meussdorffer, Architect

Interior View Great Western Smelting & Refining Co. Building
C. A. Meussdorffer, Architect



Birdseye View of Proposed Tamalpais Center, Kentfield, Marin County, Cal.
C. A. Meussdorffer, Architect

Mill Building of the Pacific Cereal Association. The First Reinforced Concrete Building Erected After the San Francisco Fire.
C. A. Meussdorffer, Architect

Interior Pacific Cereal Association Mill.
C. A. Meussdorffer, Architect

Sanitarium, Ross, Marin County, California
C. A. Meussdorffer, Architect

Dining Room in M. L. Levy Flats, San Francisco
C. A. Meussdorffer, Architect

M. L. Levy Flats, San Francisco
C. A. Meussdorffer, Architect

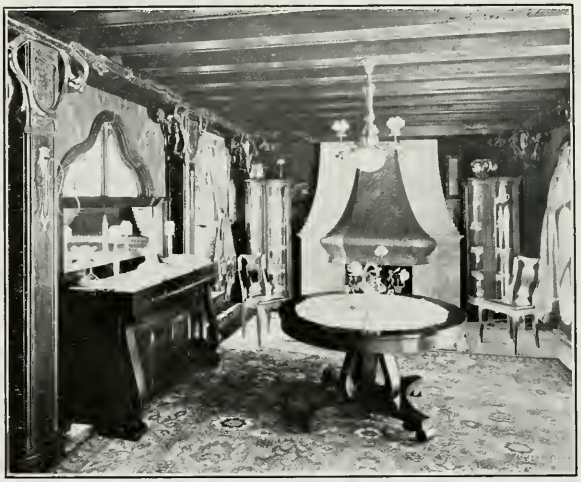
Second Flat Building for M. L. Levy
C. A. Meussdorffer, Architect

Residence of Dr. E. E. Perry, Ross, Marin County, Cal.
C. A. Meussdorffer, Architect

Living Room, Residence of Dr. E. E. Perry, Ross, Cal.
C. A. Meussdorffer, Architect

Residence of Dr. F. J Hund, Ross, Cal.
C. A. Meussdorffer, Architect

Mausoleum, Estate of John Shirley, Holy Cross Cemetery
C. A. Meussdorffer, Architect



Dining Room, Home of C. A. Meussdorffer, Ross, California

Besides club buildings Mr. Meussdorffer has given a great deal of attention to apartment houses, some of the more prominent of which are the "Riverside," "Empress," "Alcona," "Glasgow," and "St. Regis." Worthy of special comment is the "St Regis" building which covers an area of 81 x 110 feet, with two eleven room apartments on each floor, and three baths and three servants rooms. All rooms are unusually large, as for example the living room is 17 x 30 feet. Although this building was erected several years ago, it stands in advance of any apartment house on this Coast, and has the distinction of never having had a vacancy since its completion.

Another interesting structure is the mill building of the Pacific Cereal Association. This structure was originally designed in brick and the contracts were awarded three days before the earthquake. Within a few days thereafter these contracts were annulled and the structure was re-designed in reinforced concrete, and excavation was begun subsequently under trying conditions, giving the building the distinction of being the first reinforced concrete structure erected in San Francisco after the fire. Since then, however, Mr. Meussdorffer has shown decided preference for the steel frame, armored with concrete or reinforced brick.

"I believe this the best form of construction," Mr. Meussdorffer remarked several days ago. "Concrete to a certain extent is a most excellent material but I consider that it cannot be classed with armored steel on account of the several elements of chance and uncertainty, and, too, because we are in the earthquake zone and to the best of my knowledge reinforced concrete has never been given a severe test, since the local ordinances did not permit of its construction up to the time of our great earthquake."

Home of C. A. Meussdorffer, Ross, Cal.

Living Room, Home of C. A. Muessdorffer, Architect

M. L. Levy Residence, San Francisco
C. A. Meussdorffer, Architect

Dining and Breakfast Rooms, Levy Residence, San Francisco
C. A. Meussdorffer, Architect

The Significance of the Civic Center*

By JOHN GALEN HOWARD

IT is a great pleasure to me to have an opportunity of saying a few words in this very informal way upon a subject which is of deep interest to all of us, and especially just at the present time, which I believe to be one of the great psychological moments of San Francisco's history, when she is about to put her shoulder to the wheel and undertake a great task in which her future is vitally concerned. I believe this city is about to go forward in a line of progress such as she has never entered upon before; and I am convinced that this great work which she has before her will be carried through to completion with the greatest brilliancy and success.

There is now before the people of San Francisco the necessity of saying yes or no to one of the greatest, one of the noblest, projects which it will ever be her privilege or within her power to accomplish. I believe that the people are going to vote yes, and by so doing announce to the world that San Francisco proposes to take her rightful position and stand in the forefront of the world-wide movement for the betterment of cities.

Many cities in our country and abroad are putting themselves on record as in favor of development along lines such as will render the city more beautiful, more comfortable, more dignified, more worthy to be lived in, for those whose homes are permanently there, and more attractive to those who come from without her gates to sojourn there-within though only for a brief time.

Since the time, six years ago, pretty near, when a terrible thing happened to San Francisco, her citizens have through individual efforts, provided themselves anew with homes; her enterprises have covered themselves with roofs; business has been re-established; the children have been put to school in new school buildings which are a credit to the city, and would be a credit to any city wherever it may be; and lately the city has raised her standard in favor of an international exposition to celebrate the new era which is anticipated as the result of the completion of the great canal,—an exposition which shall at the same time mark and make memorable the city's rehabilitation.

Meantime the city has done nothing in the way of providing herself with a permanent administrative home. San Francisco has been generous to her citizens individually and as a mass; she has done much toward protecting herself against a repetition of the disaster by fire of six years ago; and she has now reached the conclusion,—the city fathers have reached the conclusion, and I believe the people will back them up in that conclusion,—that the time has come when she must have a roof over her own head, a civic roof, a City Hall; and inasmuch as the Panama-Pacific Exposition will be an unequaled opportunity to attract to San Francisco the interested attention of all the world, San Francisco will, I am sure, put her best foot forward and proclaim to all men, "We are going to entertain you; we are going to take you into our midst and give you the best that we have in the way of an exposition; but we are going to do more than that. We are going to show you, with a conviction that shall come home to every visitor, that we are re-established. Witness our new City Hall!"

*An address delivered at a luncheon of the Commonwealth Club, San Francisco, March 16, 1912. Since the reading of this paper the people of San Francisco have voted by a substantial majority the necessary bonds with which to erect a new City Hall and establish a Civic Center.

The only way in which San Francisco can offer a proper and convincing proof to the outer world is by building, not alone the ephemeral buildings of the Exposition, charming, beautiful as they doubtless will be, but by putting up such permanent monumental buildings for her public business as shall stand in the long future as in the present, for the expression, —yes, the very incarnation of the city's spirit and power.

We are to greet the world three years hence, a short three years hence, with a smile, and that smile will be the exposition; but it is necessary to greet the world with more than a smile. The exposition will doubtless have all the witching charm of the hostess, who alone by her feminine grace can attract the multitudes of guests. But San Francisco must not stand only as the gentle and gracious hostess. The city must prove character by standing behind the entertainment as the strong and confident host. The city's hostship can be expressed fittingly and convincingly only by setting the civic house structurally in order. At the great hour San Francisco must have a visible head architectural in a City Hall and a Civic Center such as shall be worthy of its head administrative.

I have been asked to speak on the significance of the Civic Center. In the words of Patrick Henry,—was it not?—I know no way to judge the future but by the past; nor is there a better way of interpreting the present than by the light of that never-failing lamp. I want to run over, in a hasty way, some of the great civic centers of other times, how they came to be and what they meant, both to the communities themselves and to us as an interpretation of the life of those communities; and this because I have an idea that the Civic Center means more to us here to-day than it has ever meant in the history of the world before. It means more to us because it has meant so much to others, and because, building on their example and interpreting life through terms of their experience, our civic center is going to include the significance of all previous civic centers and add to it as well.

Civic centers are nothing new. There have been civic centers from the time when there were cities. There have been civic centers from the time when the first gathering of human beings began to have social communion and community interests. I conceive that perhaps the first civic center was the fountain from the rock around which a group of nomads gathered and found that in order that they might all enjoy those living waters they must live in community and not apart. But around the spring of living waters or, in later times, around the landing place by the river side or by the seashore, or in still later times around the stronghold raised for protection upon a lofty rock (which was fortunate enough also to possess a spring of water) the cities gradually grew until in the fulness of time they realized, without knowing what they had been doing through the generations, that they had what we call by the newfangled name of Civic Center; which is nothing more nor less than the heart and head of a civic community in structural expression.

Let us look over the past and see just how towns have grown. There are various types. Take, for instance, the great example of Athens. At first, Athens was just a little stronghold on top of a rock which had a spring alongside of it. As time went on the group of buildings became larger and larger until the town began spreading down the steep slope of the Acropolis—what we call the Acropolis nowadays—and extended in a circle around the rock. The town became a city, but still the stronghold at the top was the center of authority, a castle, until the Persians came over and seized the opportunity to destroy everything on the top of the

Acropolis and to leave it bare. Everything went, and when they retired and the Greeks came back to their devastated city, they found a situation which had never before been presented. Pericles, the man in power at the time, took up the task and he said "The Acropolis shall be no longer a mere stronghold; it shall be more than that. Physically speaking it shall be a stronghold still; spiritually speaking it shall be a sacred mount. We will keep it swept clean of human habitation, but we will rebuild our temples there, the habitations of the gods, and we will make it beautiful; we will rear its walls of marble, we will paint it and gild it, and we will put our bronze statues here, and we will place our great monuments there; and we will erect the grandest buildings out of the finest materials that human hands can make."—The result was the Acropolis, executed by perhaps the greatest group of artists which the world has ever known. Phidias, Ictinus, Callicrates and Mnesicles and the rest,—half the town, no doubt,—combined and worked hand in hand with Pericles to make of the Acropolis, which formerly had been a King's house, a people's place, and a place of the gods. And men go back to it to-day, and will continue through the centuries to go, and say to themselves as they pass through the foregates, the Propylaea, and come out through those marvellous shadows into the sunlight and see across there, rising in majestic and supernal beauty, the house of the Virgin,—the Parthenon,—they say, "Man never has made and man never can make more beautiful than this."—That is the civic center of Athens; and it stood, not for mere physical power, not for mere intellectual power, but for the very spirit of antique Greece.

There is another way for a city to grow. Take Rome, that other great example of ancient achievement—totally different in character, totally different in type of accomplishment, and yet standing with Athens as the great representative of classic life, classic thought, classic achievement,—upon which our whole civilization is based.

How did Rome grow? Rome began by being a little settlement on the top of the Palatine Hall, one of seven. One can still see the wall of Romulus, which stands there perhaps as Romulus saw it built, ordered it built, or perhaps helped build it with his own hands.

From that Palatine Hill one looks out over an open space which in the ancient time was nothing but a hopeless swamp, until the Romans got behind the scheme of civic improvement and built the Cloaca Maxima, which still exists and drains that area, how many centuries after it was built, I do not know; no one knows exactly. And you look across that former swamp to half a dozen other hills, which you can almost touch with your hands. Each one of those hills originally was an independent city, at war with Rome, the town upon the Palatine.

As time went on little Palatine Rome conquered the other cities on the hills, integrated them with herself and made what was virtually a federated city. And as time went on, of course, each one of those little portions of what was now all Rome, increased in size until the city, as we know it, in historic times, became a great unit by a merger, as it were, by a coalescing of those seven little independent towns built on the tops of a circle of hills around a sunken swamp.

That little Palatine town of Romulus became in the course of ages the home of the Emperors. The first emperor was born there and built the House of Augustus as it is called to this day. The ruins are still beautiful, intensely interesting, and bringing home to us a realization of the life of those old times. And there again a stronghold—an administrative, rather than a military, stronghold in this case—became the center

of the city and the home, the heart, the hearth. And just in its shadow, just below, that old swamp became the Roman Forum. There was a civic center which was the heart of a series of communities that had gradually grown together and coalesced into one great whole, the heart and head of which was in the midst around which the cities on the hills, ever more and more populated, were gathered and encircled until in the end practically the entire world revolved around that center of civilization, which was given the name, by the Ancient Romans, of the Umbilicus of the Empire. The stone which was considered to be the center, the Umbilicus, of the Empire, is still to be seen there, tells its story, and brings home to every visitor a sense of the unity of ancient Rome. I know no place, I know no thought, I know no hook, no suggestion which carries with it the same conviction of the greatness, the unity and the eternity of Rome and her Empire and her thought as that little Roman Forum—little only in physical dimensions; big with human interest.

And there is still another way for a city to grow, more akin perhaps to the type of Athens than Rome, of which Paris is an example. Paris began on a tiny island in the Seine, a stronghold if you like, but protected, not because of isolation on the top of a precipitous rock, but because it was girdled by the arms of a deep, swift river. The Ile de la Cité, as they call it—The Island of the City—is still, in a sense, the civic center of Paris. There stands the majestic cathedral of Notre Dame, perhaps the noblest cathedral of France, the significant religious expression of French life. Clustered about it closely today are other great structures which signify the unity and consistent policy of the city in her courthouses and her various administrative buildings of one sort and another,—a stone's throw away but on the mainland is the great City Hall,—and all of them are gathered together in a group which is well-nigh unrivalled in the world, perhaps never has been surpassed in beauty and significance, even in ancient Rome.

As time went on the city became too big for its islet and overflowed, traversed the streams which surrounded it and gave it its original protection. Gradually the city grew, and grew; but still, to-day, that little island is the heart and center of the city and always will be as long as Paris is Paris. From it radiate the arteries of communication with the other parts of the city and with the outside world. Round about it are ranged in concentric rings the boulevards, which are the relics and, I might say, the monuments of its former protective bulwarks; to-day there are three and perhaps four ranges—great circulating avenues—but they all circle round about the heart and the head of the city, which is on the Ile de la Cité.

There you have three great types. There are others, but we do not need to go into them too fully. What happened of old naturally, inevitably, by the gradual unconscious growth and movement of the body politic, we often have to manage nowadays awkwardly and by force, tearing out, opening up a heart, a circulation in the midst of an American community (or foreign community, for that matter) which has grown as a mere unconscious accretion of individual efforts, individual structures, without any sense of the ensemble, of the unity of the whole, or of its possible significance as an expression of the city's life.

Our cities for the most part grow where they are put, perhaps automatically as it were by reason of the natural conditions, perhaps by command or by whim, as so many of our cities are established nowadays, some of them as a mere real estate speculation. But having once been established, they grow for the most part without any concerted effort; they grow by

one individual building a house here, and another individual building a house there, next door or across the way, and the space between gradually filling up. This is not a city in the great monumental sense at all; it is not truly a city until the people get together and work in community, work as one. And in order to work as one they have to make the city one, they have to unify it. All great cities feel the influence of that necessity, and you can hardly mention a town of any great importance in the entire country that is not conscious of the need of creating this center, which is the telling feature, the point of administrative distribution, the knot that ties, the heart that beats, the administrative head that thinks and is uplifted in the forefront of all concerted effort.

To transform our American communities is sometimes a very awkward, a very costly and a very long piece of work. But it has to be done, and the way to do it is to get at it, to go for it, and to push it through; and that is the only way that it can be done.

The doctors tell us that there are certain nervous diseases in which the patient is inhibited from activity, cannot walk, cannot handle his hands, cannot do anything without putting his mind consciously on the action he wishes to accomplish; instead of almost unconsciously walking across the room, as well men do, the mind has to put itself on the muscles of the leg, draw the leg up and put the foot awkwardly forward; and then transfer the thought and the mind to the other foot and leg and work on those muscles consciously. Our American communities are all sufferers, more or less, from this nervous disease, which inhibits action except by conscious analytical effort. The resultant movement necessarily is more or less awkward, more or less strained; but it has to be done, if you want to move; the only way to move is to move; put your mind on it and do it consciously if you cannot do it unconsciously. And our city of San Francisco has to do that—fortunately not in so revolutionary a way as many of our cities have to do.

Many of our cities, like Cleveland, in working up their civic centers, have had to take possession of long blocks of very costly property which had already been improved. But Cleveland has put her shoulder to the wheel and she is putting through such a scheme of civic improvement as makes a notable example for all the world, in this country and abroad. She will have, one of these days,—and she has very nearly realized it already—a civic center of exceptional beauty and importance. And Cleveland is only one of many.

Other cities are handling the matter in the same general way, but not all of them have reached the same degree of completion. We have plenty of examples in past time, as well as in our own, of cities which have had to take the bull by the horns and tear down in order to make good.

There is Madrid, for instance, which is an example of constant growth; she has had in succession, in various centuries of her existence, at least three civic centers—gradually developing around one public place a harmonious group of buildings; and then as the city grew fixing on another center and grouping the great public buildings around that, as for instance the Puerta del Sol in the middle of the city; and of recent years the city has been doing precisely what our American communities have been trying to do for the last generation, and establishing still a third great civic center, commensurate in scale and beauty with her increasing importance.

Rome itself, at one period and another was the subject of like amputative operations. Emperor after emperor tore out great sections of the city in order to make a new civic center or to extend an old one; and finally

Nero, you will remember, fiddled while Rome burnt at his hand in order to make space for his civic center.

Paris has been the subject of similar undertakings for many centuries; each century almost has seen Paris take up just such tasks. We think nowadays of Haussmann as being the great example of civic architects; but what he did is only another example of what was done or projected by Patte, for instance, to the glory, as he called it, of Louis XV. We have authentic documents of his plans. One of the most interesting books which we architects use in our offices is the book by Patte, illustrating the improvements which he suggested for Paris in honor of his sovereign. Haussmann under the third Empire, as you know set on foot a tremendous scheme, not even yet completed, of reconstruction of the city which was nothing more nor less than a co-ordination and an interpretation of the entire plan, making of the old town a possible city in which to live with comfort, convenience and delight under modern conditions.

Vienna is another case in point. Wren's plans for London are yet another—not carried out at that time, but London to-day is waking up to the value of the principles which underlay Sir Christopher Wren's plan after the great fire. London, like San Francisco, was too exhausted as to resources to devote herself at first to the reconstruction of the city along better and newer and saner lines; but in the course of time London has waked to the fact that she must do this in self defense, and the sooner the better. And to-day there is agreat scheme of civic improvement going on in London which is of the most intense interest; as, for instance, the King's Way, coming down from the north and debouching in two directions upon the Strand; the great Victoria Memorial improvement of the Mall from Buckingham Palace, cutting through great blocks of property in order to make access to and from Trafalgar Square immediate and attractive. Those are only two out of many schemes in London which are all contributory to the end of making London intelligible, making the metropolis of the world in fact and in aspect what London is in theory, and officially, a great capital—unified, in harmony with its own destiny, and having the courage of its convictions to say, "I am London"—which it has never said nor can say until it is one living civic organism in expression as in existence.

There are certain disadvantages in planning a city entirely beforehand—it is not always possible to foresee how a city is going to grow or how it should grow in order to make the best of its opportunities.

Washington is an example of that; a shining example of a beautiful city, a fiat city, planned by a man of exceedingly brilliant imagination. L'Enfant laid out Washington with the idea that it was to grow outward in front of the Capitol. The very fact that it had been planned to grow in front of the Capitol chanced to make it grow in the opposite direction; land was bought up by speculators and held at such prices that it was impossible for the city to grow naturally and easily in that direction. Human activities like other natural forces will move in the line of least resistance, and the city grew out back of the Capitol. It did not make much difference, I dare say, in the eventual beauty of the city; it merely made a difference in the direction of the city's growth. The Capitol turns its back to the main portion of the city (which may be a significant attitude for it to take or not, as you like to look upon it); but at any rate, the modern city is all back of the Capitol, instead of as L'Enfant had anticipated. Now the city having once been laid out fell into the doldrums of those middle ages of our country's history, the middle of the last century,

when art was about as lifeless as ever it was in recorded time. The old plan of L'Enfant was laid on the shelf and forgotten. No one thought it was worth while to continue on the magnificent lines which had been laid out. But in response to the great movement which has made itself felt and has grown with ever-increasing power upon the convictions of our country, Washington, too, has awakened, and only a few years ago the great plan of L'Enfant was hunted up in the archives, shaken free from its cobwebs, and set up again as the standard round which might rally all of the artistic forces, all of the esthetic instincts of our people. And the magnificent civic center of Washington,—the Mall leading down from the Capitol to the Monument, and on beyond to the Potomac at the site of the future monument to Lincoln—is now in process of being constructed. Already you can get a glimpse of its beauty and of its grandeur, even by the little blocks of buildings,—not so little either, save in comparison with the whole,—which are being put down here and there sparsely along its avenues.

It is possible to plan ahead, but it is often necessary to execute behind, and that is San Francisco's position to-day. San Francisco has planned ahead tremendously and worthily; she will realize her destiny in that plan one of these days. But it may not be identically along the lines that have been laid out, any more than Washington has grown along precisely the lines that L'Enfant had anticipated. It does not throw L'Enfant's plan out of the running for one minute to say that the City of Washington grew in the opposite direction. Laugh at L'Enfant if you like, but in the next instant you have to stand with your hat off and recognize that all of the essentials of his thought are there. He foresaw it all; and though he thought the city was going there and it went here, it makes no difference. The city has grown and is growing out of the great thought that he conceived and it will continue to grow in accordance therewith.

So San Francisco, holding in abeyance for the moment the great plan which was laid out by Mr. Burnham some years ago, stepping aside perhaps from the letter of certain lines of that plan, is, nevertheless, going to realize her ambitions in the execution of plans which will derive from the "Burnham Plan" even although no details, no single element of the entire composition can be found upon the old lay-out.

It is precisely the same case with the University of California, with whose architectural plans I happen to be connected. The Phoebe A. Hearst Plan is there, a living organism, which adjusts itself to every newly announced need of the University; not a cut-and-dried thing which is to be carried out in arbitrary lines precisely as it has been laid down regardless of changing conditions which it is impossible to foresee beyond a certain point. Every modification is studied with a view to the preservation of the ensemble so that at all times it is a consistent whole.

The plan of San Francisco is essentially the same whether you locate the Civic Center at the corner of Van Ness Avenue and Market or the corner of Eighth and Market, or the corner of Larkin and Fulton, or wherever you put it, except that it is important to have it in the best place. In any case the idea is there; the man behind the gun, the great thought, is there; and the mere transference of that idea from one point to a position two or three blocks away, makes little difference. Nor does a change in detail change the spirit of the project. The great idea is the governing condition always.

Have I said very much about the significance of the Civic Center? I hardly know. Yet I think the drift of my meaning is clear. There is one

thought which travels through my talk like a gleaming clue through a labyrinth—one thought, and that is, that the Civic Center signifies the unity of the community of which it is the practical need, the esthetic end and the spiritual expression. To me the Civic Center of San Francisco means, to-day, "Get together!" Tomorrow and for the time to come it will mean "San Francisco has got together, and she stands, at last, made one!" (Applause)

* * *

Building Concrete Houses Without "Forms"

AS showing the possibility of making concrete serve as its own form by erecting the work by stages the following description furnished by John J. Smith, architect and concrete engineer, Boston, Mass., may not be without interest to many of our readers.

The foundation wall was of reinforced concrete built without wood forms. Expanded metal rib studs were set up 14 inches apart and a stiff metal lath wired to both sides of studs (which are made 6 inches apart) gave a form for the wall and also provided reinforcement set up in place. The outside of these walls was given a heavy coat of cement mortar containing a little lime and hair. This when set made a rigid hollow wall which was then filled solid with concrete mixed in the usual way (but not too wet) in proportion 1:2:4. The walls, both inside and out, were floated to a sand finish with a wooden trowel. This made a very strong substantial wall built without wooden forms and only required a single bracing for the metal studs, using a piece of 2x4 as a straight edge and bracing either inside or outside, as most convenient, by driving stakes in the ground.

The walls of the house were made by setting up 2x4 studding similar to the balloon frame, but omitting the corner and other posts, also the girts and substituting in place of these solid concrete posts and girts reinforced with two pieces of the metal rib studs, which for the girts were bent in the form of a truss. Metal strips were nailed to the studding on which were applied metal lath; this was then coated with cement mortar, using lime and hair sufficient to make it trowel readily. The metal lath was backed up on the inside with a cement mortar, so as to bury the metal at least 1 inch. The outside was then given a second coat of cement mortar made three of clean, sharp sand and one of cement. This is mixed with a waterproofing compound and stippled, while the wall is green, with a mixture of one of sand and one of cement well beaten to the consistency of a thick cream and applied with a kind of brush made by tying together a bunch of light twigs.

* * *

Lenten Sacrifice

A fashionable architect in a city on the line of the Erie Canal raises his fashionable standard to the highest power by using a hyphen between the last two of his three names. The other day one of his friends, to whom the hyphen always has been a matter to be treated irreverently, came upon the architect as he was registering in a Fifth avenue hotel.

"Hi, Bill," cried the disrespectful one, thumping the architect on the back, "you've gone and left the hyphen out of your signature!"

"I know it," cooed the architect. "But it's Lent, you know. As I have to give up something, I give up the hyphen."—New York Press.

Design for New Hotel at Stockton, California
Glenn Allen, Architect

Daniel Hudson Burnham

Daniel Hudson Burnham, Architect

DANIEL HUDSON BURNHAM one of the best known and most distinguished architects in this country, died at Heidelberg, Germany, June 1. He was 61 years old. Mr. Burnham was well known on the Pacific Coast where a number of large commercial buildings stand as monuments to his architectural genius.

Mr. Burnham was a pioneer in modern building methods and the originator of many of the standard forms now in general use in skyscraper construction. His was the task to standardize the essential elements, to apportion renting space to lot area, elevator service to renting space, to minimize the cost of construction and to increase the efficiency of operation. The upkeep and the care of office buildings was also his task. The precedents established by him in the construction of the Mills building more than twenty years ago, are models that are followed to this day.

As Chief of Construction, Director of Works and Chairman of the Board of Architects of the Chicago Fair, Mr. Burnham was the dominant spirit that guided, controlled and made possible the great success that was there achieved, his first act being to surround himself with the great architects, sculptors and painters of that day. Chas. F. McKim, Richard M. Hunt, George B. Post, Augustus Saint Gaudens and Francis D. Millett all sought and found in his sympathy, opportunity for full expression of their ideals.

President McKinley, appointed Mr. Burnham Chairman of the Washington Plans Commission, upon which were McKim, Saint Gaudens, and Frederick Law Olmstead, Jr. The work of this Commission was the beginning of the city planning movement.

Mr. Burnham with his distinguished confreres founded and supported out of their private purse an American School of Architecture, Painting, Sculpture, and Music in Rome. This School has now become an institution of the United States Government.

The National Commission of Fine Arts established under Federal authority by President Roosevelt and re-established by President Taft had Mr. Burnham for its chairman.

The Chicago orchestra, built up under the leadership of the late Theodore Thomas, had among its original supporters and founders Mr. Burnham, to whose active interest it owes a large part of its success.

Besides the plan of Washington, Mr. Burnham was active in the plans of the cities of Cleveland, San Francisco, Manila, Chicago, and with the assistance of Mr. Edward H. Bennett with the plans of Minneapolis, Portland and Detroit and quite recently at his suggestion, Mr. Bennett was retained to prepare a city plan for the borough of Brooklyn, New York.

Mr. Burnham was closely indentified with the building up of many of the great commercial houses of Chicago, and was a member of the Executive Board of the Commercial National Bank of that city.

Mr. Burnham was a big man physically and of a personality that dominated those about him. In many things he was a pioneer and obstacles fell away before the force of his will. He was a poet, an artist, a musician, an architect and a business man. Always generous and liberal with his confreres, always ready to help where help was needed. His statesmanship was of the constructive order. His tolerant spirit never having an unkind word in opposition to the plans of others.

The Law Regulating the Practice of Architecture

By ROBERT MORGENEIER, Architect and Engineer.

ARTICLE VIII.

THE percipitation of a building into the excavation for the new Kahn Building on Broadway, Oakland, such building having stood on the property line of the land being excavated, naturally raises the inquiry, "Who must pay the damages"? Answering this inquiry, and also to caution architects, it may be well to say a few words on this subject: Although the subject pertains more to the law of operations *preliminary* to construction in engineering and architecture, it may suddenly intrude itself as a very important factor into those operations following later on, as recently shown in the Kahn building project, and, therefore, should stand clearly in view when the matter of excavating is under consideration, and long before any work is actually done.

At common law, every person making earthworks on, or in his own land, whether by surface excavations or underground pits, is bound so to work as not to cause any subsidence of the original soil of his neighbor. In other words, every man is entitled to have his land in its natural state supported by the land of his neighbor. It is not a question whether the workings are skillfully or unskillfully conducted; the right to support for the soil itself is an absolute right, which the adjoining owner is not entitled to infringe, whether by skillful workings or otherwise.

The common law guarantees to adjoiners the lateral and subjacent support which his land receives from the adjoining land, but this right is subject to the right of the adjoining owner to make excavations for construction if he uses ordinary care to sustain the land of the other, and *give reasonable previous notice of his intentions.*

One who undertakes improvements on his land which endangers the structures on his neighbor's land is bound to give notice of the intended improvements and to use ordinary care and skill in making them.

California has statutes which provide that each coterminous owner is entitled to the lateral and subjacent support which his land received from the adjoining land, subject to the right of the owner of the adjoining land to make proper and useful excavations for the purpose of construction by using ordinary care and skill and taking reasonable precautions to sustain the land of the other, and by giving reasonable previous notice of intention to make excavations.

Now, however, take notice, that a land owner is entitled to lateral support from the lot of an adjoining owner only for the soil of this lot *in a natural state* and *not* for a building placed on the land. Such right to lateral support does not extend to the support of any additional weight or structures.

A land owner can require of his neighbor to furnish only so much lateral support as is required to sustain the land in its natural undisturbed state. If an adjoining owner excavates nearer the boundary than such a limit, he is bound to furnish support to the land by artificial means, as by a retaining wall. If such a support is furnished, the excavation may be made up to the dividing line.

The artificial support is then substituted for the natural support of the soil, and it may be of any material provided it is sufficient for the purpose and it is continued so as to maintain the land in its proper position.

If a man builds his house at the extremity of his land, he does not thereby acquire any right of easement for support or otherwise over the

land of his neighbor. He has no right to load his soil so as to make it require the support of that of his neighbor, unless he has some grant to that effect.

One who erects a building on the line of his own land is himself in fault if he has increased the lateral pressure so as to prevent the adjoining owner from excavating upon his own land. A man who builds a house adjoining his neighbor's land should foresee the probable use of the adjoining land, and by convention with his neighbor, or by a different arrangement of his house, secure himself against further interruption or inconvenience.

An injury done to an adjoining building by reason of an excavation upon the adjoining land made with proper care and skill is *damnum absque injuria*.

While each owner may build upon and improve his own estate at his pleasure, provided he does not infringe upon the natural rights of his neighbor, no one can by his own acts enlarge the liability of his neighbor by an interference with this natural right. If a man is not content to enlarge his land in its natural condition, but wishes to build upon it or improve it, he must either make an agreement with his neighbor, or dig the foundations so deep, or take such other precautions as to insure the stability of his buildings or improvements, whatever excavations the neighbor may afterwards make upon his own land in the exercise of his right.

In the cities of New York and Brooklyn the common law rule of lateral support has been modified.

In 1885 the legislature of the State of New York interposed to regulate the exercise, by owners of land, of the right of excavation, and to afford the owners of buildings a new protection from excavations on adjoining lands. By this Act (Chap. 6, Laws 1855) it is declared that whenever excavations on any lot in New York or Brooklyn should be intended to be carried to the depth of more than ten feet below the curb, and there shall be any party or other wall wholly or partly on adjoining land, and standing upon or near the boundary lines of such lot, the person causing such excavations to be made, if afforded the necessary license to enter on the adjoining land, and not otherwise, shall, at all times from the commencement until the completion of such excavation, at his own expense preserve the wall from injury, and so support the same by a proper foundation that it shall remain as stable as before such excavation was commenced.

Under this act it has been held that in order to subject the person making the excavation to the expense of protecting the adjoining wall, he must be afforded the necessary license to enter the land; that the license must be explicit and sufficient to protect him, and it should be given by all persons who would be injuriously affected by such acts.

The act, however, does not require the owner of the adjoining land to tender a license in order to receive the benefit of the statute, but it causes the party causing such excavation to be made to request permission to enter and proceed with the excavation without injuring the wall.

If he fails so to do, he is liable for the damages.

The adjoining owner is only required to grant such a license to enter his premises when requested.

After the license to enter and make excavation has been granted and the adjoining owner has excavated below the old wall and has inserted needle beams to sustain it, his right to build a new wall to the extent that the old wall has been shored up may not be denied.

An owner of land who excavates to a depth lower than the foundation of a building on the adjoining lot, having failed to notify the owner of the building to protect his property, will be liable for the fall of the foundation wall if it is caused by the failure to do anything which ordinary care and diligence in such operations point out as necessary to protect it.

So long as the excavation does not extend beyond the owner's land and not negligently or unskillfully made, any injury to adjacent owners must be borne by such owners.

The excavation must be such as would not have caused any appreciable damage to the adjoining land in its natural state.

A land owner who excavates for a basement or cellar under his house on his land, using ordinary care and skill, after due notice to the adjoining owner, is not liable to the latter, although in digging, on his own land he digs so near the foundation of such adjoining owner's house as to cause it to settle or fall.

If notice of a contemplated excavation has been given the owner making the excavation is bound only to a reasonable degree of care and skill.

In excavating he has a right to go below an adjacent owner's foundation wall, even thought it is reasonably certain that such foundation walls will be endangered thereby, and after giving due notice to such adjacent owner, the person excavating is chargeable only with reasonable care; it being the duty of the adjacent owner to use the necessary appliances to protect his building.

* * *

Building Foundations in Quicksand

IN erecting the eleven-story dormitory annex of the West Side Young Men's Christian Association a rather interesting problem presented itself and that was the building of the foundations in a basin of quicksand through which ran a stream of water. The new building is on West Fifty-sixth street, New York City, and on one side is the present dormitory of the Association and on the other, a seven-story apartment house. Foundations of both buildings rest on this basin of quicksand and to excavate for a foundation beneath the level of the footings of these two adjoining buildings meant that the quicksand would ooze from beneath them and both structures be undermined.

In successfully performing this engineering feat piles were first sunk through the quicksand to bed rock, the piles varying in length from 20 to 45 feet, due to the slope of the rock surface underneath. So treacherous was the quicksand that the piles could not be driven with the ordinary drop hammer for the reason that the vibration would have a tendency to destroy or injure the adjoining buildings and it was therefore necessary to use a steam hammer having a sharp blow.

There is a swimming pool 20x60 feet in the basement of the new dormitory and to provide for this caused the architect and builder no little concern, as the foundations for the pool and a portion of the pool itself extend below the footings of the adjoining buildings. It was evident that if an excavation was started for the pool the quicksands would fill in as quickly as taken out. Something rather novel, therefore, in foundation construction was finally decided upon. At the time the piles were sunk a wall of sheet steel piling was driven down all around the lot, thus effectually preventing any movement of the quicksand. Excavation for the swimming pool was then made without danger to the surrounding property, the pool resting on a reinforced concrete bed, which in turn is supported by the piles.—The Building Age.

Vacuum Cleaning—What It Is—What It Does and How It Does It

By G. B. F. OWEN.*

PROMINENT among twentieth century utilities vacuum cleaning has taken its place with magic strides. Ten years ago it was unknown. Today everyone knows something about it, even though such knowledge goes no further than familiarity with its name. Our effort will be to offer a simple and non-technical explanation of this marvelous invention.

Vacuum Cleaning is not vacuum cleaning! Vacuum does not and can not clean. The cleaning medium is air, and vacuum denotes absence of air. Hence, reduced to its simplest form, "Vacuum cleaning" is in reality "air cleaning."

In the most perfect way and in the shortest possible time it removes dust and dirt from every surface with which the cleaning tool comes in contact, conveying the dust through a system of piping at incredible speed to an air tight receptacle in the basement, whence it is periodically removed for final disposition.

Briefly stated, the enormously rapid flow of air into the cleaning tool through the body of the carpet or fabric being cleaned carries with it every particle of dust that lies in its track. The size and more or less rapid motion of a cleaning tool over the surface to be cleaned will determine the speed with which the work can be done, but there are other considerations making for efficiency that will be explained a little later on in detail.

Vacuum Cleaning is not only an art,—an industry,—but a science. The physical laws governing it are very few, very simple, but inexorable.

A certain volume of air must be moved at a certain velocity to do perfect work. An acceptable system must combine those two factors, with a third equally important, viz: The cost in money of producing the wished-for result. Let us see how these factors can be coaxed into harmony, and at the same time we shall see how impossible it is to produce the desired result without harmonization of these features. We shall then be prepared to take up in detail the elements or parts that compose a vacuum cleaning system, and shall be impressed with the fact that as no chain can be stronger than its weakest link, so no vacuum cleaning system can be better than its poorest part.

We have said that vacuum cleaning is not vacuum cleaning at all. What part, then, does vacuum play in the combination? The answer is simple. By partially exhausting the air from a closed vessel we create therein more or less of a vacuum as we remove more or less of the air. The air exhausting may be accomplished in various ways. We are now dealing simply with the vacuum itself, not with the method of producing it. The instant the air is removed to any extent from a closed vessel the pressure of the atmosphere seeks to force an entrance. This pressure is 14.7 lbs. to the square inch (at sea level), so that an opening of one inch area would admit air with an atmospheric pressure behind it of nearly 15 pounds to equalize the pressure in the vessel. It is this atmospheric pressure which does all the work. We simply create a partial vacuum to enable one of nature's laws to assert itself; or in other words, to permit nature to establish a flow of a certain volume of air at a certain velocity into a closed vessel or tank. The vacuum, therefore, is simply the motive power for the air. Having established a basis upon which to calculate the volume and velocity of the air so moved, we must decide upon the *quantity* of air and the *rapidity of its flow* necessary

* General Engineering Company, San Francisco.

to do the work. At this point we are confronted with a problem not easy of solution. Stated in words instead of figures it is this: How much dirt must we be able to move after we get it, and what rapidity of flow will enable us to get it under working conditions? It is a well established principle that no vacuum cleaning system is really efficient and none will be considered tolerable when people are familiar with its possibilities, that has not the capacity to get and dispose of one pound of dust per square yard of surface cleaned. The natural impulse would be to conclude that any volume of air moved at a sufficiently high velocity would carry practically any amount of dust. Here again physical law places a barrier, which in effect says "You are wrong," and in fact we find that we are very wrong. A careful analysis proves that any volume of air has a carrying capacity with reference to dust, of only about 3% of the capacity of the air itself to move under given conditions. Here we have the first clew as to the *volume* of air necessary to carry the dirt. Clearly understand this:—We could not move dust in a vacuum. The air, therefore, in motion acts as a vehicle for the dust. In the best vacuum cleaning practice provision is made for moving about 60 cubic feet of air per minute as being the requisite volume to carry away the dust secured through an orifice of a certain size. Now, how shall we get the dust which has become cemented more or less solidly into the fabric of a rug? Will a flow of air over the surface of the rug dislodge it? Certainly not. It is only by the very rapid flow of air through the fabric of the rug under the lips of the tool that can wholly remove the objectionable dirt, and the process is as follows: A partial vacuum is created in the dust tank. In exact proportion to the area of the tool orifice a certain known volume of air flows into the tank by atmospheric pressure at a certain known velocity, carrying the dust which has come into the track of the moving air by the motion of the tool, and to that extent the rug is cleaned.

In the above description of the true vacuum cleaning system we have indicated the use of a closed tank. Without such an adjunct no vacuum could be maintained in the real sense of the word. It is well known that air in motion is seeking to equalize a partial vacuum somewhere in the direction of its flow. In the case of a revolving fan there is no accumulation of power to move the air as there is in what we might call a "storage of vacuum," the full intensity of which is effective at every point covered by the tool; and it is this that does the work.

Now let us see what constitutes a properly designed vacuum cleaning system. We find four vital parts, interdependent, calling for careful proportioning and ample provision in each case for all the exigencies of the work to be done. The four elements are:

1. The vacuum producer.
2. The system of dust separation from the air.
3. The system of piping or conduits.
4. The cleaning tools.

VACUUM PRODUCER

This may be of any mechanical type from the familiar piston pump to the most refined method of the present day for exhausting air. One of the characteristics of air is its elasticity. Under varying conditions it may be expanded or compressed to an enormous degree and this property of expansion and contraction carries with it strange phenomena. The more you expand air the lower becomes its temperature and, conversely, under pressure its temperature rises rapidly. We have seen that the displace-

ment of a large body of air is the prime necessity in vacuum cleaning. How shall the volume of air be displaced? The most familiar form and the one most largely used until recent years was the reciprocating piston pump operated by the steam engine, and later by the electric motor. Let us assume a closed tank with a connection to the suction side of the vacuum pump. By measurement we find the cubic capacity of the tank—say one thousand cubic feet. Now let us take into consideration the capacity of the pump to move free air. We measure the area of the piston in square inches; multiply that by the length of stroke in inches, and again by the number of revolutions per minute, and we have its nominal displacement capacity in cubic inches per minute; dividing this total by 1728 we get the cubic feet per minute it will displace. Let us say this displacement is 100 cubic feet per minute. It is natural to suppose that with a ten-cubic feet displacement per minute and a thousand cubic feet of air to be displaced, the pump will exhaust the latter in ten minutes, but it does nothing of the kind. Why? Because we figured its displacement of free air, and as the tank was closed we did not give it free air to displace, but instead 1,000 cubic feet at atmospheric pressure without any possibility of replacing what the pump removed, so instead of moving 100 cubic feet the first minute as we thought it would, we find that as soon as the smallest particle of air was removed the remainder instantly expanded and filled the entire tank, *but no longer at atmospheric pressure.* The vacuum gauge on the tank would show the continuously rising vacuum as the pump displaced more air. A perfect vacuum would be represented by the rise of a mercury column 30 inches (at sea level), but a perfect vacuum is impossible. Partial vacuum may be created to perhaps 28 or 29 inches. The ordinary working vacuum is considerably less. Let us assume that the gauge shows a vacuum of 10 inches. We have said that a perfect vacuum would be 30 inches and represents the pressure of the atmosphere at sea level of 14.7 pounds per square inch. For easy figuring let us call this 15 pounds. Our gauge shows 10 inches which is one-third of 30; hence we have a negative pressure or suction of one-third of 15 or 5 pounds per square inch. This means that with an opening in the tool of one-inch area, air at atmospheric pressure is rushing into our vacuum tank with a pressure behind it of 5 pounds. Exhaust the air until the gauge shows 20 inches and we have two-thirds of 30 inches and two-thirds of 15 pounds, so that the pressure now forcing the air into the vacuum is just double what it was at ten inches or 10 pounds per square inch, but what has happened in our pump during this process? It has not displaced the air to its nominal capacity, for the simple reason that atmospheric pressure was not there for it to displace; it has been drawing air in a greatly attenuated or expanded condition, and has had to be supplied with a very much greater relative amount of energy by the engine as the vacuum increased in the tank. With approximately 15 inches showing on the gauge the energy expended by the pump is just double its efficiency in air moved at atmospheric density. The other 50% of the power consumed has disappeared with no result whatever, except its ability to move or displace the rarefied air in the tank. Let us go a step farther. At 25 inches of vacuum on the gauge the displacement of air in the tank will have been increased about 15%, but the engine will have had to supply power to the pump sufficient to have moved 7.7 times as much air as it moved under 15 inches of vacuum, so that a gain of less than 15% efficiency entails a loss in power equal to 700.7% due to rarefaction. What does this teach us? That the most economical point at which we can do

the best work is 15 inches of vacuum or less, as shown on the gauge at which point the loss due to rarefaction is equal to the efficiency in air moved.

We must, therefore, find the most economical device in power consumption to move a large volume of air under approximately 10 to 15 inches of vacuum. The piston pump no longer fills the bill. It is extravagant of power, complicated in its mechanism, requires much attention of a skilled nature, while it is noisy, pulsating, and therefore intermittent in its action. What is required is a continuous suction device, capable of maintaining a given vacuum at the least possible cost for power, and with the greatest possible freedom from repair and maintenance expense, and requiring as little skilled attention as possible. Numerous devices have been offered, and it is not our object to designate the best. There are many good ones, and even the piston pump is a favorite in many quarters, due largely to its antiquity and familiar appearance. Enough has been said, however, to show that the vacuum producer should be regarded as the heart and lungs of the system; it is what creates vacuum. Vacuum calls for power and power costs money.

DUST SEPARATION

Next in importance comes the system of dust separation. Remember that the air flowing into the tank is the vehicle carrying the dust. The air must be gotten rid of to make room for more. The dust must be retained in the tank in order to avoid carrying it out with the exhaust, which would simply remove it from the interior of the house and dissipate it through the surrounding atmosphere. This has been a vexing problem from the beginning. Many devices, most of them ingenious and a few of them practical, have been used. They fall under two general classifications Wet and Dry separation. In the former two tanks are used; into the first or dry tank is discharged the dust-laden air; the heavy particles are settled by gravitation; the rest is carried over into the second tank into a body of water kept in motion by auxiliary devices and the air being exhausted by the pump from above the water creates a partial vacuum into which the air rises on its way to the exhaust and is supposed to leave the remaining dust into the water. These tanks are necessarily large and the water occupies about 16 inches of space in the second tank, which must be supplied with water supply connections, clean-out door, waste connection, hose connection for washing out and so on. When the water is fresh and clean the power necessary to draw the air through the water seal is relatively small, but as the water becomes muddy from mixing with the dust it thickens considerably and offers much greater resistance, so that in some cases we have known it to consume as much power as would be necessary to do excellent cleaning had there been no water. This, of course, represents an extravagant waste of energy and therefore of money, bringing the cost of operation up to an abnormally high figure.

Another design known as dry separation produces the desired result without water in any form, either in a body or spray, with the result that the dust is separated from the air without any material consumption of power in the process. Such systems can be operated at a much lower cost per unit of work or time, are simpler in construction, require no water connections and very much less attention.

A third system of dust disposal is now seeking recognition. It was experimented with very extensively in the past and discarded after numerous trials. This is known as sewer disposal, by means of which all the dust is supposed to be discharged into the sewer without the interposition of tanks, either wet or dry, but careful examination will show that instead of a tank,

the base of the machine is used as a chamber into which the dust is discharged, generally with a supply of water and driven against a screen of perforated metal, which retains in the chamber the larger particles and permits the residue to be carried through the pump or to be discharged to the sewer, but the chamber in the base is in effect a separating tank, which has to be cleaned frequently and the job can be better imagined than described. It is one of the most offensive necessities known to an enlightened age. Dry separation is therefore, the correct method until something better shall have been devised, which is not yet. Even in the case of sewer discharge it is absolutely necessary to separate the air from the dust and water before the two latter reach the sewer connection, as the discharge of air under pressure into sewers is prohibited.

PIPING

When we realize the tremendous speed at which the air moves through the piping system connecting the tool with the dust separator at a distant point in the basement, we can readily see that every effort to reduce friction in this line will result in a smaller consumption of power to operate the plant at its highest efficiency. Imagine this line of piping indefinitely extended and in time all suction would disappear at the tool by reason of friction in the pipe, and as suction at the tool is what we are after, friction must be eliminated as much as possible. Here again we are confronted with a physical law governing our selection of sizes. A given volume of air moving at a given velocity will keep clean and free from dust a horizontal pipe line of a certain length and size. Reduce its size and friction is largely increased. Increase the size and you not only reduce the velocity, but the capacity of the air to keep the pipe clean being limited, you will have a part of the large pipe (equal to the area of the correct size) kept free and the crescent shaped space below it will fill up with dust, which, due to reduced velocity, cannot be carried to the tank.

Galvanized piping should be used for the reason that the dust laden air will cut a smooth surface on the galvanization, still further reducing friction, which would not be the case with black pipe. Pipe-bends and fittings are a very important feature of the system. Ordinary pipe fittings sanitary fittings, drainage fittings, Durham fittings—whatever name be used for them, were never designed for rapidly moving air. A short right angle turn means great friction and a considerable loss in velocity. While practical for slow moving material such fittings are not scientifically adapted for vacuum cleaning work. Smooth bore fittings have been devised for this purpose, which together with long sweep bends in the pipe where possible and long radius ells where fittings are required have done much to reduce this unnecessary power consumption. Fittings for this work should show an interior diameter exactly equal to that of the pipe. All joints should be carefully reamed and no pockets or obstructions of any kind permitted to interfere with the rapid flow of air.

TOOLS

No part of the vacuum cleaning system is more important than the design of the cleaning tools. These should be, in each case specially adapted to the work it is to perform. They should be light, easy to handle, easily interchanged, of the highest efficiency, simple in construction and not likely to mar furniture, fabric or decoration.

Utilities to be most valuable must show speed, convenience and economy. You would not think of adopting a new device that cost for

performing a certain service more than your old method, or that took longer to do the work. Inventions to be of value must increase the capacity of their operating attendants, and the greater this increase, the more valuable the invention.

TIME FACTOR

One of the most vital and yet most neglected phases of mechanical cleaning is the time factor.

To operate any mechanical cleaning tool, whether the toy of toys or the real thing, requires the undivided time of one employee whose salary and board costs say $2.00 per day. Including the cost for power, which even in the real vacuum cleaner, is a small item, it is plain that a system that will do twice the work of another cleaner will save $1.00 per day. If it will do six times the work it will save $5.00 per day; or if capable of 10 times the work it will save $9.00 per day. The same figures will apply if we figure the time occupied in doing the same amount of work.

If a certain one-man operated plant is worth $500.00 is another one-man operated plant of half the cleaning efficiency worth $250.00? Decidedly not because the latter plant would cost for labor $1.00 per day, or $26.00 per month, or $312.00 per year more to operate. Then what is it worth? Relatively it is an expense and not a profitable investment. What then are we to say of apparatus frequently offered having far less than half the possible efficiency? This time factor, outside of the question of efficiency, is a most important thing to remember, for if the operator can cover 10 times the area in a given time with one device that could be covered with another, the former system would be by far the best investment at ten times the price, even if both in the end were equally efficient. A farmer might plow a 160 acre tract with a spade, but it is far cheaper for him to use the horse or steam drawn plows to do this work.

The whole trend of human endeavor is to increase man's capacity. The inventor who makes it possible for one man to do the work of two does the world a lasting good. From a commercial standpoint there is no better investment, no easier, surer, saner way to make money than to buy something that will save labor. And here let us suggest that the best mechanics in the world with the Bank of England behind them could not produce a correct vacuum cleaning system without having gone through the school of experience, any more than they could build a Steinway piano without the necessary study and experimentation.

Being a comparatively new art, the public must be educated in the selection and the use of vacuum cleaning system. Simplicity, therefore, is an important factor. The preliminary stages of this education have been passed. Vacuum cleaning is known of by the many just as wireless telegraphy is known of by the publicity its merits have earned; yet how few people could select the right system and operate it. Vacuum cleaning is very general in its application. No building that has to be cleaned can afford to be without it, because it does vastly better work in far less time than is possible with hand methods. Obviously, however, no one type or size is equally good for all classes, or sizes of buildings any more than one medicine can be a remedy for all ailments. Different conditions and requirements call for different appliances to successfully meet them. Hence we must provide systems to take care of the largest buildings, and others to be used in every style and type of structure down to a modest $4,000.00 or $5,000.00 residence, and at this point we find the greatest number of failures. Many so called "systems" have sprung up in a night as it were, for which claims of adaptability were made that under the test of opera-

tion in varying conditions failed utterly to justify the time and energy expended on them. A familiar illustration of this is found in school work where the conditions and requirements differ from these in any other field, and call for careful study in the solution of a new problem in cleaning, which made necessary the designing of special tools to do the work. Yet few manufacturers recognized this; nearly all assumed that what was suitable for a hotel or office building would be "just the thing" for a school building, with the double result of failure in their own case and a prejudice aroused in school circles against vacuum cleaning in general. This is gradually being overcome by intelligent investigation on the part of school boards.

In closing let us say that "intelligent investigations" should be the watchword of every buyer. By that means only can the one correct system be decided upon for any work under consideration.

* * *

The Pardonable Sin

By ERNEST IRVING FREESE*

"For each in the joy of working,
And each in his separate star,"
Delineates things as they ought to be,
Instead of things as they are.

I WILL not say that architects are the most vain and deceitful of men. I will not say it because, perchance, it might be construed as a confession, for I, myself, do vow allegiance to the ancient art of Ictinus and Callicrates. Instead, I put a query,—Who among you would accuse the weaver of tales and storybooks of deceit? Then, by the same token, why the architect? For the point I make is this—inglorious but undeniable!—that the clever and beautiful architectural renderings of today bear the same relation to real architecture that the storybooks do to real life.

Thus far the analogy holds good, and thus far only. For our storybooks, above all, must have a happy ending. But what of the proposed building that our client believes is represented by that clever drawing? Alas—the end is anything but happy—for that picture is architectural fiction, or, to use the parlance of the office, it "don't work out." It was conceived in the heat of inspiration—the embodiment of the designer's imagery, a perfectly balanced, well composed whole, complete in itself—a perfect picture, alive and palpitant with the joy and expression of its creator, the architect. Ah, 'tis true, he delineates things as they ought to be instead of things as they are!

And why? But few words will tell the story—for into that first picture, that first conception of what ought to be, the architect put his whole soul, unstinted and free, and he evolved a thing of beauty.

But afterward—ah yes, afterward—into the actual building he put his client's money, and—well, the money wasn't as "unstinted and free" as it might be.

So there you are. That's why this beautiful drawing didn't "work out." You see folks are more concerned nowadays with "building" than with "architecture," and, after all, architects are human and they have to earn their bread.

*Architect, Los Angeles, Cal.

Why Public Buildings Should Be Dignified

THE influence which good public building exerts upon the raw immigrant has seldom been so clearly and intelligently expressed as in a recent interview had by a newspaper correspondent with Mr. James Knox Taylor, supervising architect of the Treasury Department, Washington, D. C.

"Doesn't the expense of maintaining a building together with the interest on its cost make Uncle Sam's rent bill pretty large?" asked the correspondent.

"Unquestionably," replied Mr. Taylor. "As a business proposition simply, no public building pays. By way of illustration, let me give you a little arithmetic concerning a suppositional town that has a postoffice costing $50,000. The interest on that sum of money at 2 per cent, the government rate, would amount to $1,000 annually. Light, heat, water, repair and janitor service would be from $1,500 to $2,000. At the lowest reasonable estimate the building would cost the government $2,500 a year. Ordinarily a store room large enough and good enough in every way for the postoffice could be rented for $800. But you must recollect that a public building is not a business enterprise, no matter if it is located in a small city or in Washington and is used as a meeting place for Congress or a residence for the President. Public buildings are speaking witnesses of the power, dignity and greatness of the country. There are 90,000,000 Americans. Not more than one in every hundred of our people ever get to see the City of Washington. The 90 who stay at home, I venture to say, have only a hazy notion of the authority, solidarity and wealth of their own government.

"To them the government in Washington is far away, intangible and even mysterious. It is brought to their very doors, however, when a public building is located in their vicinity. They see its substantialness, and likewise they see the American flag waving daily from its staff in the breeze. The building, well-kept, solidly built and impressive becomes to them a center of national government. They pay taxes, they will never get to Washington, as I have said, and the building is the only visible return they will ever receive for the money taken away from them for national purposes. Then we should remember that there are millions of foreigners in the United States. They came from countries where government is constantly observable and where it makes itself felt to the humblest citizen.

"They were accustomed to public buildings at home and to officials in uniform, with gold braid on their caps. Coming here and settling in or near a Western town, they find the United States attorney in a shabby room over a butcher shop, the United States Marshal above a dry goods store and the postmaster between a saloon and an undertaking establishment. 'This is a h—l of a country,' they say to themselves in their own tongue.

"The government is scattered and meanly housed and the immigrant concludes that the national capital must be cheap, unclean, weak and poor. But if the same immigrant sees a public building in the town, he has chosen for his home and the Stars and Stripes fluttering in the Western wind, he has respect and not contempt for his new allegiance and that is what is needed in this republic—respect for law and for lawmakers, respect for court and judges, and respect for all rightful authority, including the parents of our own children. Hence we must not regard public buildings as business investments. On the contrary, they are moral influences, teaching patriotism which is pride as well as love of one's country and exemplifying the strength—and you notice that I put a shade of emphasis on that word —and the dignity of our national government.

The Architect and the Fire Waste*

By C. M. GODDARDT (Member N. F. P. A.)

ARCHITECTS, in many individual cases, and through their associations have done much to assist in bettering conditions. The late Mr. Alfred Stone of Providence gave a great deal of time, for years, to work in connection with the National Electrical Code. Mr. Robert D. Kohn, as the representative of the American Institute of Architects on the Executive Committee of the N. F. P. A., and your own Mr. C. H. Blackall and others have been of invaluable assistance to us in our work for better standards of construction; but this is not enough, and we look earnestly for the time when the men who, if they will, can control the general practices and customs of the building trade, will present a united front, pressing forward to the adoption of such standards as will entitle this nation to the reputation of caring more for future results than for the profits of to-day; when we can refute the claim that we are interested only in our individual, selfish monetary profit and pleasure, and can justly claim that we take some care for the profit, pleasure and protection of the brotherhood of man.

The recklessness of the American people in taking a chance, and the love for the almighty dollar are characteristics which must be modified before we can accomplish the desired ends.

It was dollars that made the old building in Newark, N. J., a better investment to rent or buy; it was dollars that crowded the Asch building and locked the doors; it cost dollars to give employees time for fire drills, and it costs dollars to erect properly protected stairways, and efficient fire escapes; in fact it is all a question of dollars.

The American people mean well, but they have acquired the habit of thinking in dollars instead of lives, of thinking in dollars for to-day instead of in thousands of dollars for the future. We are not a people who are taught by startling examples. The effect of these is transient. Our teaching must be by education which makes for permanent character.

Only a few years after the Collingwood school disaster Boston decided to change the school building requirements from strictly fireproof to substandard fireproof. It costs too much to give absolute protection to her school children!

Less than two weeks after the Bangor conflagration the Massachusetts General Court killed a bill prepared by experts and recommended by the Mayor to lessen the conflagration hazard in Boston by requiring fire-resisting roofs, fireproof party walls, and open spaces between frame buildings in the tenement and apartment house district. The Mayor says, "What methods the lumber interests, which were so active in opposing the bill, may have used I cannot say, but I know that in the fair field of open argument they were completely overthrown and left without a single plausible excuse for their opposition." Here again the action of the lumber interests was due to the question of dollars being placed above lives.

Less than a year ago I was obliged to send an expert to appear before the Aldermen of a city which adjoins Chelsea, to argue against the repeal of an ordinance which prohibits shingled roofs. One might have thought that the Chelsea conflagration, which was largely due to shingled roofs, would have outweighed the influence of the builders who build simply to sell, for it was from that class that the proposition for repeal apparently originated. A slate roof costs but little more, and in the long run is cheaper

*Extract from address before the Boston Society of Architects, February 6th, 1912.

than shingles, but in a cheap house built to sell the builder cares nothing for the long run and everything for the first cost.

If we are to prevent conflagrations, we must have better fire-resistive construction. We must build so that our fire departments may confine the fire to the building in which it starts. Inflammable roofs and other similar superstructures breed conflagrations from flying sparks and embers. Unprotected window openings allow the lateral spread of fires from building to building. Frame sheds and out-buildings in the rear of otherwise fairly good fire-resistive buildings carry the fire in the rear from one building into another. Good internal protection such as is afforded by automatic sprinklers is a powerful adjunct in confining fires to the building in which they originate. Reasonably small floor areas and protected vertical openings in floors, especially where buildings are filled with combustible goods, are a great advantage. Fire extinguishers, inside standpipes and hose, and fire pails which are readily accessible, will frequently control a fire which otherwise might prove serious and even result in a conflagration.

No body of men are in better position than the architect to assist in the education of the public along the lines of better building construction, which will do much to relieve us of the disgrace of every year burning half the value of the new buildings we erect.

Experts of the United States Government, after thorough investigation, estimate the cost of our annual ash heap, excluding forest fires, at nearly half a billion of dollars, and Massachusetts alone in the first six months of 1911 destroyed over half a million dollars in forest fires. May I not justly claim that the conservation of our created resources from destruction by fire is a subject worthy of your attention?

I think I fully appreciate the position which the architects occupy,—that it is your business to produce what your customers want, as they want it. At the same time, you must admit that your customers come to you because they believe you know more about what a building should be than they do, and that you can, to a great extent, influence them to build along safe and sane lines. Your knowledge of the strength of materials tells you just what is necessary for the safety of a structure from the standpoint of stability, and I venture to assert that you would refuse to stand sponsor, as architect, for a building if you felt it must be so built that it was a menace to its owner and occupants. Is it not equally your duty to familiarize yourselves with the requirements which will prevent a building from becoming a menace, through fire, not only to its owners and occupants, but to its neighbors and perhaps to a whole city? You go abroad to study architecture in cities more beautiful than ours. Is it necessary on your return that you use wood to build and shingles to cover the buildings you design from what you have gathered there, when such materials are practically unknown in the places you have visited?

Gentlemen, there is just one way in which we may effectually and permanently put a stop to the appalling loss of life and property by fire, and that is by educating public opinion so that we will look upon the unnecessary loss of life and property through some one's carelessness or neglect as we do upon manslaughter and stealing, as a crime rather than as a misfortune. Our laws and building codes will then be enforced because we all wish it, rather than be evaded as now, if it can be done by deceiving or corrupting the building inspector. Law alone, without this public opinion, will not accomplish the result.

Cities will still discover that almost every known law as to theaters is evaded as soon as such spasms of public horror as the Iroquois disaster have subsided.

Courts will aquit men, like the proprietors of the Triangle Shirtwaist Company, in the face of conclusive evidence that violations of the law caused the death of 146 human beings, because, forsooth, it could not be proved that the violation was the actual cause of the death of the poor girl specifically mentioned by name in the indictment!

People will still plead for the shingled roof from æsthetic and commercial reasons, in spite of the fact that it is admitted by all experts and every fire chief to be one of the most flagrant causes known for spreading fires and producing conflagrations.

Notwithstanding the fact that hundreds of lives and millions of dollars are annually lost through fires from "strike-anywhere" matches, men will offer to Massachusetts Legislators as a reason why the sale of other than safety matches should not be prohibited, that the carrying of a box of matches in the pocket would disfigure the symmetry of the outlines of a man's dress-suit, and still not be hooted from the committee room; and items such as recently appeared in the Cleveland Plain Dealer, announcing that five babies were burned to death in that city from match fires inside of three days, will still adorn our daily papers.

It has not been my intention to speak to you this evening simply as the representative of the fire insurance interests. No man can call his life a success who uses his chosen vocation simply as a means of getting the dollars which buy his daily bread and never draws lessons from his work which may assist him in being of benefit to someone besides himself. What I have said has been with the idea of emphasizing the necessity of arousing public opinion, a lesson that comes to me whether I wish it or not in my daily contact with the effects of fire: Most useful when our servant, most cruel when our master.

May we not, every one of us, go back to our daily tasks with the determination that none of the responsibility for the fire curse of this country shall rest on us, and that in so far as in us lies we will do our part toward hastening the time when our cities and towns shall be so built, so protected and so cared for that we may point with pride instead of shame to our fire record when compared with that of other nations.

* * *

Needed Covering

John Sloan, the well-known artist of New York, takes the same intelligent interest in architecture as in painting.

A New York architect, aware of Mr. Sloan's excellent taste, took him in his motor car to see a huge and costly country house that he had erected for a millionaire on a bluff overlooking the Hudson.

As the architect stood with Mr. Sloan on the terrace of the new property he looked up at the mansion's showy facade and said, thoughtfully:

"Stupendous! But I haven't decided yet what kind of creeper to have in front."

"The Virginia creeper," said Mr. Sloan, "would cover it up quickest."

—Exchange.

* * *

A Course in Architecture

The Pennsylvania State College, located at State College, Pa., is offering a four years' course in architectural engineering. The courses are designed to supply the fundamental training for the structural architect and engineer. Two years of design are supplemented by a course in structures and allied scientific studies.

Millions to be Spent for Worlds Fair Buildings

SAN FRANCISCO is planning to entertain the world on a grand scale in 1915. Before the city had been selected as the location for the Panama Canal Exposition more than $17,000,000 had been publicly contributed in California for the big show. Since then the public fund has reached $22,000,000. It is estimated that more than $80,000,000 will be expended on the exposition.

Several sites will be occupied by the buildings, but according to a writer in Harper's Weekly they will be units in a superb group. The two principal sites are at Harbor View and in the west side of Golden Gate Park. Harbor View lies as a crescent on the bay, half way between the ferry and the sea. Golden Gate Park faces the Pacific Ocean and runs back to the city. A winding boulevard will be the link between these two sites. A trackless trolley will run over it and it will be a permanent addition to the city's attraction.

At Harbor View will be located the Midway and other features that lend themselves to brilliant electrical effects. An existing lagoon will be converted into a superb yacht harbor; an aquarium will be located there and the most marvelous collection of the strange and brilliantly colored fish of the tropic waters will be brought together. Also at Harbor View will be located great structures to house the heavy exhibits that may be unloaded from ocean-going vessels directly upon the grounds. Among these will be the manufacturers and machinery buildings, the Palace of Liberal Arts and the buildings to house industrial features.

Lincoln Park is a lofty knoll 150 acres in area, 200 to 300 feet above the waters of the Golden Gate. The park will be adorned with terraces and statuary and an observation cafe, glass enclosed and of several stories. But the crowning achievement will be the St. Francis Memorial Tower, a huge commemorative edifice which, like Bartholdi's Statue of Liberty, will welcome vessels from afar.

Plans have been accepted and the tower will be 850 feet high, including the shaft and a granite anchored base 220 feet square. The shaft will be 85 feet square, of steel construction and of marble and terra cotta veneering. The approximate cost will be $1,000,000. From its summit one will be able to look almost straight down upon the waters of the Golden Gate, 1,100 feet below.

From Lincoln Park south to Golden Gate Park the distance is almost one mile. Between these parks the exposition directors have secured a connecting strip of 200 acres of privately owned land that will be devoted to use of foreign concessionaries, to live stock exhibits, to gardens, and doubtless to exhibits from Alaska, Hawaii and foreign countries.

One of the most notable foreign concessions will be that just proposed by the Chinese merchants of San Francisco, who have at their command many millions and are enthusiastic. A Chinese display of large dimensions will be surrounded by a model of the great wall of China. The concession will be built at a cost of $1,000,000 and it is planned to have the whole work completed by the latter part of 1914. Junks, sampans temples and pagodas will be included within the concession, and the visitor may, if he wishes, take a rickshaw or automobile around the top of the great wall.

Golden Gate Park will be the site of the permanent structures which will remain after the exposition. Among the striking structures here will be a huge concrete coliseum to surround an existing stadium with a seating capacity of 75,000 people and in architecture like that at Rome.

Awnings will shade it and it is planned that an automobile race track shall pass into the stadium.

A marble art gallery, with the noted paintings of the world will be among the features, while a chain of lakes at different levels will be connected by a working model of the Panama Canal. In Golden Gate Park Japanese and Chinese residents of the Pacific Coast may build typical edifices in which their societies can meet and their archives may be kept.

Perhaps the most remarkable and unusual feature will be a wonderful series of Chinese, Japanese and Hawaiian gardens. The rarest plants of the tropical Orient will be shown with those of more temperate regions. The marvels of Oriental gardening as developed for centuries will be expounded, and a wonderful Hawaiian water garden is planned. Many acres will be comprised in this exhibit.

All told, San Francisco will spend more than $100,000,000 in public improvements within the city itself. The State of California has voted $9,000,000 in bonds for piers and improvements on the San Francisco water front, aside from the $5,000,000 it has appropriated for exposition purposes. The construction of that portion of the scenic boulevard which will lie in the Presidio is among the works which it is anticipated the government will undertake, while the Presidio affords a splendid opportunity for the most comprehensive military and government service display ever made.

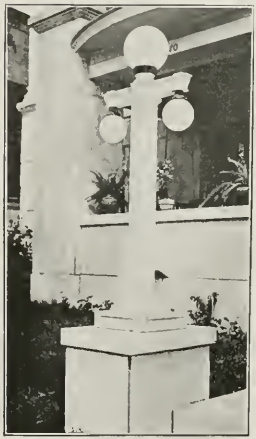
The ferry building at the foot of Market street will be the entrance to Exposition City, with a grand court of honor and probably viaducts to permit visitors to pass from either side of the street. Near the junction of Market and Van Ness will be established a civic center with a great auditorium to accommodate conventions during the exposition. A new city hall to replace the one demolished in 1906 will form the nucleus of the civic center, and Mayor Rolph announces that this structure, to be built in classic style, will be completed by March 1, 1915.

Private capital will erect a grand opera house at the civic center and other structures within a considerable radius will be built or remodeled to conform to the general architectural design. Telegraph Hill, looming 287 feet above San Francisco Harbor, will be terraced and surmounted by the tallest wireless tower that can be constructed; from the tower messages will be flashed to ships passing through the Panama Canal.

The exposition will have as its opening event a battleship parade through the Golden Gate, composed of a composite navy of the fleets of the world. This fleet, the largest ever brought together, will be reviewed by the president of the United States and foreign dignitaries at Hampton Roads and will then proceed via Panama Canal to the Golden Gate, arriving at San Francisco Harbor about two weeks after the exposition opens. From unofficial advices it is anticipated that more than 100 foreign battleships, in addition to those of the United States, will participate in the display. Every nation in the world that has a battleship will be represented, says President Moore.

Following the assemblage of battleships in San Francisco Harbor will come a succession of major events at intervals of two months apart, with minor events between. Among the major events will be a series of parades and pageants of the nations of the Orient lasting for a week. Down the streets of San Francisco in exposition days will pass such Oriental pageants as the world has never seen. China, Japan, the Philippines, India and other Oriental nations will join in a series of displays which will rival the Durbar in magnificence and perhaps surpass the Durbar in viewpoint of diversity by reason of the many nations represented.

New Type of Hollow Concrete Column



Lamp Post of Concrete, Murray Apartments, Kansas City, Mo.

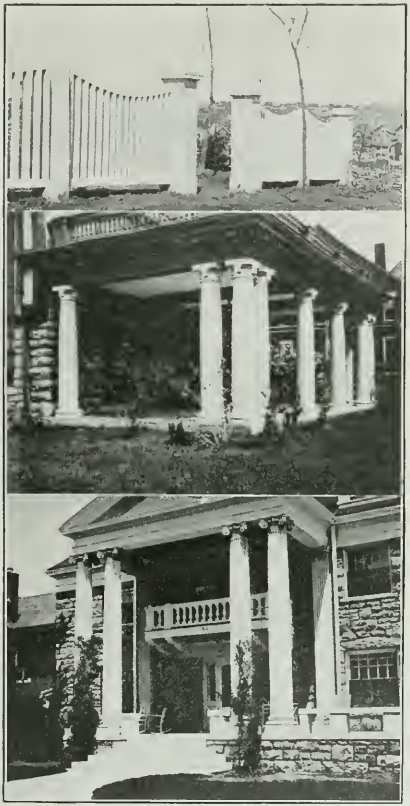
IT is important in increasing the usefulness of concrete in various construction details, that architects be given a freer hand in the matter of design than is allowed them when they are limited in their use of concrete columns for instance; to columns cast in molds of regular design. A multitude of molds are available from which to make a selection, but it frequently happens that the architect has some special idea to be executed in concrete and in making possible such freedom of design, interest attaches to a system of construction which has met increasing favor in Kansas City, Mo.

Many architects in that city are now using Trusswall columns of concrete not merely because they can be made after special designs but because they are hollow and therefore light and may be handled without great expense.

Accompanying illustrations show the uses to which these columns have been put.

In the manufacture of these columns, it became necessary to manufacture true to detail, to make them perfectly round, and to have efficient reinforcement in order that the columns could be handled safely at minimum expense. It was necessary to eliminate mold marks and follow all specific details; for this reason the column is turned. The first operation is to set a collapsible core on which the column is constructed. The core is also used as a mandrel. As the core is revolved, a system of templates of both wood and metal is employed in developing any lines required by the details submitted. The mandrel is revolved between two adjustable standards, and the first coat of cement plaster is applied on the core. After this first coat has set so that the column may be handled, it is then wired by winding a wire spirally around the column from end to end until it is interwoven into a mesh. If the load on the column is extra heavy, upright reinforcing rods are anchored in the mesh. The lathes employed

Concrete Columns of a Large Type in the Factory



Upper Cut Shows Concrete Fence

Center Illustration Shows Concrete Porch Designed by Shepard, Farrar & Wiser of Kansas City.

Lower Cut Shows Residence of Wallace Good, Root & Siemans, Architects.

in the manufacture of the columns are adjustable to take the smallest as well as the largest pieces, and adjustment is made by one man in a few minutes.

After introducing the reinforcing, the final coat of concrete is applied and the templates give the column its form. This method of applying the concrete makes it possible to trowel and float it down, thus insuring maximum density. The column is finished with any texture varying according to mixture, and special trowels employed to finish the surface. The column is then removed from the lathe and allowed to cure.

The column when cured is so rigid that it has not been necessary to devise any special means of delivering it to the building.—Concrete.

The Concrete Garage

THE often quoted old-time absurdity of "locking the stable door after the horse is stolen," is almost equaled by the too frequent custom of storing costly automobiles in wooden structures. No matter what care is exercised, a considerable amount of oil must needs fall upon and be absorbed by wooden floors. Besides, this condition of the floor produces a decidedly deteriorating effect on rubber tires. A wooden garage means high insurance premiums, as many have learned to their cost.

As ordinarily constructed, garages call for skilled labor to a much greater extent than do those built of concrete. A plain single-story garage can be constructed without elaborate plans under the direction of a competent foreman, and this is being quite extensively done. A building of more than one story or one elaborate in design, of course, calls for a competent architect or engineer entirely familiar with the different phases of concrete construction, especially so when reinforced concrete floors are used.

From the standpoint of wonderful development the automobile is keeping pace with that of concrete construction, and it seems peculiarly appropriate that one should provide the housing for the other. This is strongly emphasized by the circumstance that the automobile is invading the farms and villages of the country, where elaborate and costly garages are not constructed or desired. The American farmer is usually accustomed to the use of tools, with which he is well supplied and frequently himself constructs the smaller buildings on his premises. This has become more the rule since he became familiar with the nature and employment of concrete. Even if he lives in a section of the country where lumber is plentiful he would still be foolish to employ it in constructing a building in which to house his automobile. He is fast finding this out and the circumstance is doing much to permit the enormous increase in Portland cement production now so much in evidence.

Five different methods of constructing concrete garages are now distinctly popular, and are used singly and in various combinations. These are: mass or reinforced concrete; concrete hollow tile; concrete block; pipe frame with wire lath and stucco; wood stud frame and stucco. For such construction intelligent and practical suggestions are made by some of the larger cement manufacturers, and these can readily be secured by those wishing to build substantial fireproof garages at a small cost for material and less for labor.

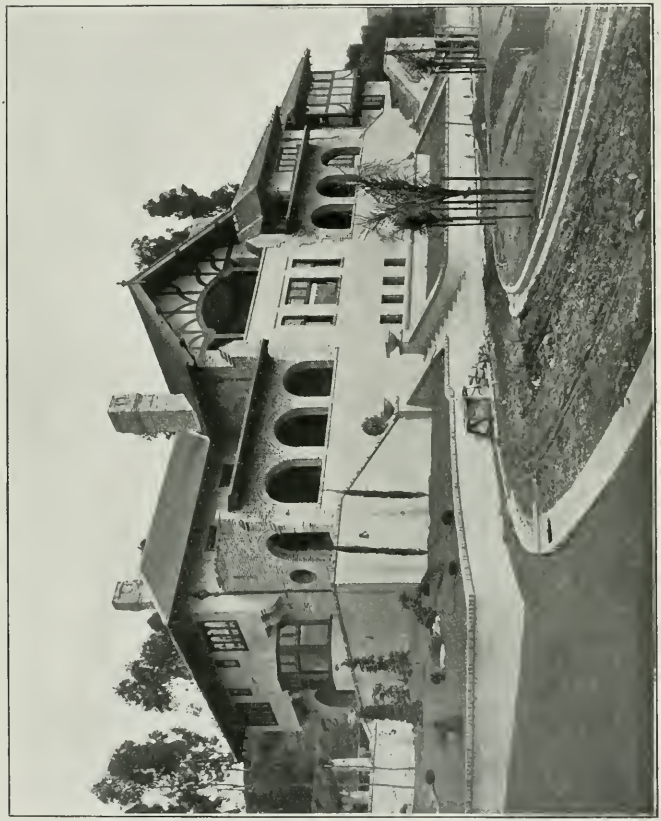
These suggestions, it should be understood, apply only to small and simple garages, the construction of which is no more difficult than that of other small buildings. People sometimes undertake to act as their own architects and builders where they wish to erect garages and other buildings that call for vastly more technical knowledge than they possess. Save in exceptional cases, where one is especially well informed or possessed of something like genius, this is a distinct mistake leading not only to disappointment on the part of ambitious amateur architects and builders but tends to bring discredit on Portland cement. Builders of garages should exercise judgment and not attempt building feats that are beyond their powers. Those in a position to buy and maintain a costly automobile can afford to employ a competent builder to construct for them a garage that goes beyond a simple form.

* * *

Bringing Pressure to Bear

"I'm afraid I can't give you any work. We're hiring about all the men we can use here now."

"I know, sir, but you'd never notice the difference in the little amount I'd do."



The J. L. Giroux Residence, Hollywood, California

Frederick L. Roehrig, Los Angeles, Architect

The Woolworth Building in New York City

Story of the Largest Structure Ever Built Reads Like a Page from the Arabian Nights

THE world's largest office structure, the Woolworth Building, now in course of erection on Broadway between Barclay street and Park Place will use enormous quantities of building materials. In fact, there is little doubt that more materials will be used in this building than in any structure so far erected on the American continent. It weighs 250,000,000 tons. It rests on sixty-nine pillars of cement reaching down to solid rock from the street level. These cement columns are encased in steel columns which themselves weigh 1,500 tons each.

This building, the tower light of which, 750 feet in the air, will be seen ninety-six miles out at sea, has in it 20,000 tons of structural steel. The biggest beams are 44 by 30 inches, though there are many girders and supporting piers riveted together.

Forty-five thousand dollars' worth of glass has already been ordered for windows and doors and skylights. In the walls and floors are to be over thirty thousand square feet of hollow tiling and terra cotta. The cement order will run into the tens of thousands of bags. On the weekly payroll is a regiment of men from mere lifting and carrying laborers to the circus performing iron-workers, who play around at 700 feet in the air on slender steel beams like orioles on an elm bough. Their wages run from $1.50 a day for the laborers to $4.50 up a day, and the payroll issues some $5,000 a day into the money channels of people who need money mostly. This has been going on for two years.

The 30,000 square feet of land on which the building stands costs about $4,500,000. It cost over $1,000,000 to dig out the foundations and the basement and sub-basements. The cost of construction will be nearly $9,000,000, making the whole pile an investment of approximately $13,500,000. The mere knowledge that such a building was to be erected on the spot caused the tax assessments on the property to be raised from $2,250,000 to $3,200,000.

There will be a floor space, taking all the floors together, of twenty-three acres. There is to be room for about 2,000 offices, and it is figured that the daily population of the building will be 10,000 and the transient population about as many more.

Down in the depths for the lighting of this young city is an independent electric light plant capable of lighting 31,000 25-watt lamps. On the other hand, so far have systematization and modern inventions of cleaning advanced, the present plans for the inside force—the elevator men, engineers, watchmen, window cleaners and scrub women—will number less than one hundred and seventy-five men and women who will receive an average wage of $12.50 a week. The rent roll will approximate annually $2,500,000 when the building is filled.

In comparison to other high buildings, the Woolworth Building is to be 50 feet higher than the Metropolitan Tower, 133 feet higher than the Singer Building and 245 feet higher than the Washington Monument. The only higher structure in the world is the Eiffel Tower in France, which is 985 feet high, but it is not a building.

* * *

When the wolf is at the door we are not likely to have any other callers. Some folks forge ahead and some forge themselves into the penitentiary.

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New State Architect

State Engineer W. F. McClure has appointed John W. Woollett of Woollett & Woollett, San Francisco architects, to the position of State Architect, succeeding Leonard Coates, who resigned during the administration of former State Engineer Nathaniel Ellery. Woollett's salary will be $4,800 a year.

Anent the appointment State Engineer McClure, has addressed the following communication to this magazine.

On page 112 of issue of The Architect and Engineer for April appears a statement made by the writer concerning the office of State Architect. Inasmuch as an appointment has since been made for said office, herewith an explanation.

There has been no change in judgment in the matter. In Section 2 of the "Engineering Law" there is the following declaration—"He (the State Engineer) shall have charge of all the engineering and structural work of the department and may receive hy and thru the approval of the Advisory Board such special assistance of a technical character beyond the employees hereinafter specified as they shall allow for the proper conduct of the business of the department."

It was under this provision that I wished to operate, but overlooked the full meaning of the language in that no consideration was given the words "beyond the employees hereinafter specified." This language refers to Assistant Engineers, State Architect, Architectural Designer, Draughtsman, etc., mentioned in Section 6 of Engineering Law; and further on, in Section 11 are the following words; "All architectural work of the department shall be under the charge of the State Architect, and it shall be the duty of said Architect to make plans, etc." It is therefore, quite clearly the intent of the law that while special and expert assistance is authorized, such authorization is not contemplated until after the appointment of, or independent of the appointment of an architect.

Yours very truly,
W. F. McCLURE,
State Engineer.

No Intention to Slight Mr. Bryant

Editor The Architect and Engineer:—I am sorry that the resulting "joshing" which I received on my quotation of "Thanatopsis" and attributed to Longfellow in article City Beautiful upon its appearance in the San Francisco Examiner did not result in my sending correction to you. I am inclined to hold you equally to blame with the City Editor of the Examiner and myself. Neither of you learned editors seemed to have noticed the mistake but I am quite sure that none of the three of us have any intention of slighting our old friend William Cullen Bryant. I shall be very much interested to receive any comments that you may reap for the mistake in question. In the meantime my name being attached to the article I suppose the josh is on me.

Yours very truly,
CLARENCE R. 'WARD.

Seven Story Building for Oakland

Architects Fred'k H. Meyer and Walter Reid have prepared plans for a 7-story Class A store and loft building to be erected by M. J. Laymance adjoining the new Security Bank on Broadway, Oakland. The building will cost in the neighborhood of $100,000.

Cost of the Temporary City Hall

Editor The Architect and Engineer:—

On page 94 of your May number the cost of the Temporary City Hall is stated to have been $400,000.00 We understand that this arose from a statement inadvertently made by one of the contractors at the meeting and of which you published the Report. These incorrect figures have also, as a consequence, appeared in another publication. As the monthly rental paid by the city for this building (viz: $5,250 00 a month) is well known, we feel that in fairness to the owner of the building and to the city administration, that, as the cost of this building was fully $700,000.00 (exclusive of land) it should be so stated.

We trust you may find it convenient to do this in an early issue.

Wishing you continued success,

Yours truly,
WRIGHT, RUSHFORTH & CAHILL,
Architects.

Civil Engineers' Convention

A movement has been inaugurated by the Los Angeles members of the American Society of Civil Engineers to have that city selected as the convention city for the annual meeting in 1913, although San Francisco has already made a claim for it. The 1912 convention will be held in Seattle from June 25th to 28th, and the principal obstacle to be overcome in securing the next annual meeting for Los Angeles is the fact that this would make two successive meetings on the Pacific Coast. The year 1913 is to be one of unusual significance in engineering accomplishments in this section, marking the completion of the Panama Canal, the Los Angeles aqueduct and the development of Los Angeles harbor.

A Correction

On page 62 of the May Architect and Engineer appeared a full page halftone of the new state building at Agricultural Park, Los Angeles. The caption read "Exposition Building," and credited the State Engineering Department with having designed the structure. The correct caption should have been: "The Historical and Art Museum in Agricultural Park, Los Angeles. Hudson & Munsell, Architects, Los Angeles." We are glad, indeed, to rectify this inexcusable error.

Life Class of San Francisco Architectural Club

The life class of the San Francisco Architectural Club meets every Tuesday and Thursday evening. The sum of $6 is to be charged for the course of three months. This fee must be paid in advance. Mr. E. Spencer Macky is the instructor. Mr. Macky has recently returned from Europe and is a very competent man.

More About San Francisco's Proposed Suspension Bridge.

An outline of his plan for a suspension bridge across the bay from San Francisco to Oakland has been sent to the board of supervisors by Allan C. Rush, an engineer of Los Angeles. He estimates the cost of the bridge, which is to be nine and a half miles long, at $26,000,000.

On the map submitted by Rush the San Francisco approach to the proposed bridge is placed at Lombard street, and Telegraph hill, and extends to Jones street. The bridge crosses Goat Island and extends in a straight line from the San Francisco end to the Oakland tide lands north of the Key Route railway and ending near Emeryville.

The distances are given as follows: San Francisco to Goat Island, 9370 feet;; Goat Island surface line 4000 feet; Goat Island to pier No. 10 on the Oakland side, 8920 feet; pier No. 1, at the San Francisco shore to the San Francisco terminus, 14,000 feet; pier No. 8 to the Oakland terminus, 14,000 feet; total distance, 50,290 feet.

There are to be ten piers, with a distance of 2230 feet between each two. The clearance in the channel on each side of Goat Island will be 150 feet. The estimated depth to rock bottom in the bay is between 140 and 150 feet. The depth of the water at the piers is marked as follows: No. 2, 54 feet; No. 3, 87 feet; No. 4, 116 feet; No. 7, 42 feet; No. 8, 12 feet;•No. 9, 17 feet; No. 10, 6½ feet.

The height of pier No. 1 at the San Francisco side and of pier No. 10 at the Oakland side is to be 1400 feet, and the summit of each may be used for a United States light signal.

The bridge is to be a double-decker, with separate passageways for steam cars, street cars, automobiles, horse-drawn vehicles and bicycles, as well as for pedestrians.

Apartment House and Hotel Annex

Architects William Curlett & Son of San Francisco have completed plans for a 6-story and basement steel frame Class C apartment house to be erected on Howard street near Natoma, San Francisco, for R. D. McElroy, and which will cost in the neighborhood of $130,000. The building will be one of the most completely equipped apartment houses in San Francisco. The same architects are letting contracts for the construction of a 7-story annex to the Hotel Argonaut and which is expected to cost in the neighborhood of $150,000.

Personal

The architectural firm of Scholes & Lochridge, well-known Long Beach architects, has been dissolved, and each will continue practice, with Mr. Lockridge retaining the offices at 614-617 First National Bank building. Architect C. B. Scholes will open a suite in the Curtis building.

Locates in San Francisco.

Architect Fay R. Spangler, formerly of Ellensburgh, Washington, has opened offices in the Foxcroft Bldg., San Francisco, Mr. Spangler has been granted a certificate from the California State Board of Architecture and will transfer his membership in the American Institute of Architects from the Washington Chapter to the San Francisco Chapter.

Architect Schultz Busy

Architect Arthur G. Schultz of San Francisco is busy in the preparation of plans for a number of substantial buildings in the Mission district. Among the structures for which plans have been completed is a hotel on Mission street near 16th for Chas. Rehm and a concrete store building for Mrs. C. Bohr in the same district.

New Mission Dolores

Architects Shea & Lofquist of San Francisco, have completed drawings for the new Mission Dolores Church and construction work is about to be started. The style of architecture will be mission, in keeping with the style adopted by the priests in the early days of California. The edifice will be of reinforced concrete and will cost close to $200,000.

In New Quarters

Architects Ernest Coxhead and Almeric Coxhead have opened new offices on the 13th floor of the Hearst Building, San Francisco. Architect William Knowles also has large offices on the same floor. Architect A. J. Bain is now located in suite 209 Hearst Building, and Architect J. A. Bagley is at No. 318 in the same building.

Architects Should Send for It

The United Electric Co., Rialto Building, San Francisco, offer to send free to all who write a most valuable monograph on vacuum cleaning, giving in an unbiased way all the essential facts connected with the various types of the stationary models, their methods of installation, tables of efficiency, etc.

James Knox Taylor Resigns

James Knox Taylor, supervising architect of the Treasury Department, has tendered his resignation to the Secretary of the Treasury. Mr. Taylor has been in the government service since 1895. He has announced his intention of engaging in private business. Mr. Taylor has been a credit to the Department, and has raised the standard of government architecture to a high plane. It will be no easy task to fill his place.

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Commenting upon the Houston fire, the Dallas News remarks:

THE WOODEN SHINGLE AGAIN

The shingle roof gives to every fire the possibilities of conflagration. When there is a high wind, such as seems to have prevailed at Houston Wednesday morning, the shingle roof gives to every fire not merely the possibilities but the probabilities of a conflagration.

As a text in non-progressiveness concerning a very practical matter, this antiquity of the shingle roof is thought provoking. Never has there been a serious conflagration that covered any considerable area, in any city, but the shingle roof figured as a most active agency in spreading the flames. This is not due altogether to the fact that the shingle roof is no protection to the building on which it is placed. Just the statement of that fact is sufficient. But burning shingles in a high wind become flying torches. They act as so many incendiaries, and no fire department ever organized is competent to fight effectively against them.

Fire prevention, so far as it has become a science, has not yet properly concerned itself with this menace that is widespread in every city. We have done a great deal and at great expense toward making the best business property fireproof; but very often much of that work is rendered useless by the shingle roof that is put over the residence property or the lesser business property. A fire starts in some congested district where this sort of roof prevails, as was the case at Houston; there happens to be a high wind blowing and the burning shingle roof soon does the rest. Baffling all human efforts, the fire gathers headway and is carried to other parts of the city, and the next morning we read of the destruction of millions of dollars worth of property that might have been saved if there had only been provided a proper fireproof covering for the buildings on which shingles were used, and the municipality had compelled its adoption.

A FOOL BORN EVERY MINUTE

How often the advertiser of building materials in popular journals is one whose goods will not stand expert tests and who is forced to cater to the inexperienced and individual consumer for his market. Chromatic pictures of picturesque roofs, gaily painted bungalows, beautifully inlaid floors, tropically warm interiors, ideal kitchens, mosquito and fly-proof windows, and equally alluring views of other sections of the house are given to induce the lot owner to become his own architect. The popular journals help out in this campaign by furnishing ready-made cut-and-dried sets of plans, so that quite a formidable array of forces is made against the legitimate architect and contractor. It is true that the victim of these aids to Building Atrocities is an innocent party who believes all that he reads in these journals and only becomes aware of the fact (after his money is all spent) that to design and build a house is as much of a science as to make a horseshoe, compound a prescription or cut up a beef. Then the inharmonious, impermanent and unstable results remain with him as a continual aggravation and a topic of reproach by his neighbors.

A drug is boycotted by physicians if it is advertised in popular journals and we believe that a roofing material, house paint, floor covering, radiator, etc., which appeals to the non-professional constituency should be placed on the "black list" of the architect and contractor. These manufacturers have made their bed and should lie upon it. They cannot expect to serve two masters. The very fact that they go into the popular journals at all is a confession of their weakness and the Architect and Contractor will do well to accept these advertised specialties at the manufacturers' own low estimates of their products as evidenced by their unwillingness to submit their goods to expert tests.

Observations

The Camera in Business

Nowadays the camera is an important adjunct of the architect's and contractor's equipment. He "snaps" the work at its various stages and gives visual support to his reports of progress. In case of controversy a set of films is almost as important as a set of plans.

× ×

"Why Advertise in Tripoli, if You Want to Sell in Troy?"

Advertisers who want to reach Pacific Coast readers cannot do so by using Eastern publications. Especially is this true of architectural magazines.

The Architect and Engineer covers the Pacific Coast field thoroughly, going to architects, contractors, builders, material men, capitalists, etc., and wields an influence and has a prestige which stands back of its advertisers.

× ×

Exposition News

It is unfortunate that the Panama-Pacific Exposition has for its President one who is at odds with the Governor and other officials of the State of California.

Governor Johnson accuses President Moore of "deliberate breach of faith" and "excessive political zeal." This seems to have thrown President Moore into a "funk" and we have not heard from him in a public way of late.

× ×

Overheard Conversations

"Hello! Hello!! Is this Henry George?"

"No, this is William H. George."

"Do you engage in public debates?"

"No; my specialty is private rebates."

"Then you are not the advocate of the S. T. T. (single tax theory)?"

"No; I am an advocate of the U. T. T. (under the table) custom."

× ×

Shipping Instructions

A rural contemporary says:

"Any subscriber who wishes to submit to us a sample of building brick is requested to leave same at our front door instead of delivering through the window."

× ×

A Summer Drink

There goes a "Gin Rickey" said a bystander as a group of four passed the other day. A glance showed that Mr. Ginley could supply the liquid, Mr. Sugarman the sweetening, Mr. Vogelsong the lime and Mr. Lansing the mixer.

State, County and Municipal Engineering

Good Roads—Water—Sewers—Bridges—Fire Protection

A Plea for Segregated Bids.

Editor The Architect and Engineer.—The arguments of Mr. W. E. Hague in your last issue gives the General Contractors' plea for monopolizing building contracts and usurping the Architect's functions. If, as he claims, an architect's duties should be confined to the drawing of the plans and should not embrace the superintendence of construction, then he narrows down the professional duties so that they terminate at the beginning of construction work and the general contractor steps in as the real Czar before whom all knees must bow. Does not an architect like Mr. Wright see that, in supporting such a division of labor, he is placing his own profession in jeopardy and that the general contractor who is so ready to supplant the specialty contractor will soon dispense with the architect's services?

Indeed, the last month's Architect and Engineer (in its editorial "Give the Architect Protection") calls attention to an abuse which has already crept in, where a large contracting firm is donating sets of plans and specifications. To fall into the trap set by the general contractor in advocating the doing away with segregated contracts, the architect would soon be "hoisted by his own petard." It is true that the architect would earn his money more easily by the process recommended, but "easy money" is not always the safest and he would be jeopardizing his very existence.

In your article in this same issue on "Schools of Architecture" you point out that a true architect is equipped with all the necessary knowledge and experience to successfully carry a building to completion; and why, then, he should involve his client in an extra expense of delegating his work of superintendence to others, is a mystery hard to solve by any clear and far-sighted system of reasoning.

The specialty contractor does not welcome these new "middle men" who are attempting to fasten themselves like barnacles on all building construction. With an organization (which is planning to become even more extensive and far-reaching) the general contractors will soon become a new form of Trust who will dominate the entire building situation. They have stepped in because of the weakness of the architects who permit this usurpation. To say that the specialty contractor, under the present and efficient bonding system, cannot be made to produce correct work at the specified time is absurd—especially as by substituting a general contractor you do not alter the conditions or change the workmen.

It seems to us that the capitalist should have something to say about the introduction of this added expense to the cost of construction. Beyond the cost of drawing the plans the architect's six per cent includes two per cent for "superintendence." If by employing the general contractor the owner is obliged to pay an extra ten or fifteen per cent for this same "superintendence" of the specialty contractor's work, then we claim that he is "stung" pure and simple and has reason for a good strong protest at his architect's incompetency or laziness.

If Mayor Rolph and the City Authorities want to employ City Engineers and Supervising Architects as well and then pay an extra commission to the general contractor, it is up to them to do so, as they have a Public Treasury to draw upon; but in these days, where economy is such a factor in construction work, it seems a pity that private capital should tamely permit an extra and useless tax to be foisted upon them and help encourage a set of middlemen who will some day, if unchecked, develop into a lot of autocrats and violators far more dangerous than any Labor Unions.

A SEGREGATOR.

Big Concrete Dock for Railroad.

Cummings & Kiehl, construction engineers, with offices in the Central building, Seattle, have the contract for building the Great Northern dock at Vancouver, B. C. The work was designed by A. Munster, of Seattle, and is to be of reinforced concrete, which in the aggregate will amount to about 7,000 cubic feet. The reinforced concrete piles are to be 16 inches square, which in some places will extend 45 feet below the floor. The cylindrical piers of the same material will be 4

feet in diameter, and the floors will be of the regular reinforced concrete slabs. The steel reinforcement will consist of rods ranging from ½-inch to 2-inches diameter. This dock is being built on Burrard Inlet, the work being now in progress under direct supervision of E. W. Cummings. This is among the first experiences in dock building in which reinforced concrete has been used and undoubtedly the work will be watched with much interest by the contracting and building men.

The Employers' Liability Law

Mr. Willis I. Morrison, a member of the State Industrial Accident Commission, gave a very interesting talk on the Employers' Liability Law before the Southern California Chapter of the American Institute of Architects at their regular May meeting. This accident commission is provided for in the Employers' Liability Law passed by the last legislature and was created to carry out the purposes of that act. As the law has now been in effect for some time, and a great many accident cases have been adjudicated by the board, the practicability of the law as it meets present day needs in actual operation has been determined beyond question. The good points of the law were thoroughly discussed by Mr. Morrison and several defects, not in the law itself, but in lack of sufficient legislation to satisfactorily carry out all provisions of the act, were pointed out. The first part of the law abrogates the doctrines of assumed risk and negligence of a fellow servant and modifies the contributory negligence theory into the comparative negligence rule. Another of the chief benefits to the employe is that he is to receive medical attention at once and that whatever compensation he is entitled to is received in a very short time, in fact within a week or two in most cases, and not to exceed over three months, thus coming at the time when he or his dependents need assistance most. On the side of the employer, his liability is limited to a maximum of $5000 for any single accident and he need not fear the exorbitant verdicts of juries which have reached $50,000, and more. The very certainty of the law makes the probable liability of an employer a closely defined and insurable risk.

At the conclusion of the talk, numerous questions were asked of Mr. Morrison. Great interest was aroused by the question of Mr. A. F. Rosenheim, as to whether, if one of his draughtsmen should prick his finger with his compass and amputation became necessary, he would be liable for damages, and the determination of the fact that he would. It was also determined that the owner whose building was being constructed by direct contract was not liable, the contractors being regarded as the employers. If an employe of a general contractor was injured by an employe of the plumbing contractor, two methods of procedure were open. The injured man could proceed in a court of law directly against the plumbing contractor or he could secure compensation from his own employer who could in turn proceed legally against the plumber.

One of the chief problems in connection with the working of the law to be yet solved is to secure the payment to the injured employe of the compensation to which he is entitled in case his employer is not financially responsible. This can only be done by a compulsory insurance law for the employers. Then comes the question of providing this insurance for the employers at a nominal rate. In Mr. Morrison's opinion this can only be done by state insurance or employers' mutual benefit insurance. Several bills will probably be introduced at the next meeting of the legislature to further improve the working of this law which has proven such a success even in its infancy.

A Notable Concrete Bridge

Sufficient concrete to put a six-inch cover on a fifty-foot street a mile long is contained in just one pier of the new Sacramento River bridge of the Southern Pacific, recently completed and placed in operation as a part of the double tracking of the system. Completed, the new bridge is 2,200 feet in length, contains 19,000 cubic yards of concrete and 9,200,000 pounds of steel. It has the heaviest span of any like structure yet erected, weighing 6,300,000 pounds.

The upper deck has an eighteen-foot wagon road with a five-foot side walk on each side. The lower deck is to be used for the double tracks of the Southern Pacific. The piers upon which the bridge rests average 90 feet in height, or about as tall as an eight-story office building, and each occupies a space as large as an ordinary city lot.

Bulletins

The Architect and Engineer is in receipt from Rolph, Mills & Co., Western Metropolis Bank Building, San Francisco, of Bulletins as follows, copies of any of which will be mailed architects on request:

Hydrex Products.

The Membrane Method of Reservoir Waterproofing.

"Saniflor" Sound Deadening Waterproofing Felt.

Hydrex Preservative Paints.

Hydrex Waterproofing Felt.

Swimming Pool Waterproofing.

Pluvenox Ready Roofing.

HEATING AND LIGHTING

Plumbing and Electrical Work

Ornamental Street Lighting as a City Builder*

By C. E. STEPHENS

THE growing and ever increasing use of our streets by night demands adequate street illumination. The best lighted streets attract the largest crowds. An increase of intensity of illumination increases traffic, and the property values fluctuate with the density of the crowd. It is a noteworthy fact that, in many of our cities and boroughs, one street or section thereof, or perhaps one side of a particular street, is congested with traffic, while other sections in the immediate locality are practically deserted. In some cases this can be attributed to the character of the business houses, but in a large proportion of the cases, there is no doubt but that the illumination of the several sections is responsible for the condition.

Very little need be said to convince the average citizen of the positive value of well lighted streets. It remains, therefore, to profit by the experience of others with the various systems in use and to select the one which more nearly fulfills the requirements of local conditions.

The fundamental problem to consider in the illumination of any street is the intensity of the illumination required and its production at a minimum cost. The cost includes the expenditure of energy, cost of maintenance, and interest and depreciation for the lamps, plant and all auxiliary equipment.

The area to be lighted is a long and comparative narrow strip. The result to be obtained is an approximately uniform intensity of illumination along the street with a somewhat higher intensity at street intersections.

When considered from the standpoint of economy without regard for illumination and decorative requirements, if energy cost is low, large units at great distances apart are better, and if energy cost is high small units placed at frequent intervals are more economical.

*From a paper before the Pennsylvania Electric Association.

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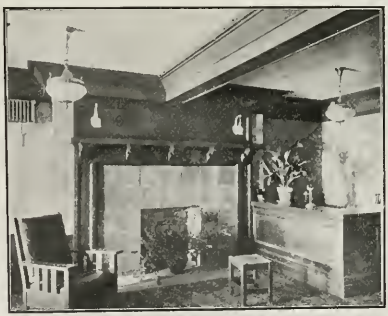

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The long period of insufficient and generally unsatisfactory illumination of the streets, is now being succeeded by a period in which central stations, civic organizations and merchants are making a gigantic effort to improve conditions. This effort has resulted in the installation of a large variety of lighting systems.

The ornamental lighting systems in general use may be classed under three general heads, as follows: Festoon, arc, and post systems. We shall mention briefly the chief advantages and disadvantages of each, as given in various reports.

The arc system was perhaps the first one installed, which could be classed as an ornamental system. It consisted of incandescent lamps supported by arches extending from curb to curb. It gives an extremely spectacular appearance, and the large source of light eliminates sharply defined shadows. The experience with this system extends over a number of years, and the principal defects may be noted as follows:

The arches are long, comparatively heavy, and are difficult to support with sufficient rigidity to withstand high winds. The material used for the arch construction deteriorates very rapidly. The lamps are in such position that they are not readily accessible for replacement and cleaning. The distribution of candle power is such that bright bands of light are secured immediatedly under the arch and dark spots midway between arches. The individual position of each lamp makes it impracticable to use any form of reflector for properly directing the light rays, and considerable light is wasted. The ends of the arches are necessarily low—and the lamps produce a glare in the eyes. The day light appearance is unsightly, and detracts from the architecural beauty of the buildings. This system is rarely installed at present and has been succeeded by the arc or post system or possibly a combination of the two.

In the arc system, use is made of the metallic flame style of lamp. The efficiency of the system is very high, and the maintenance cost low. The maximum candle power of this type of lamp is near the horizontal, and it is, therefore, possible to place the posts at great distance apart and at the same time secure a uniform intensity of illumination. This makes it possible to use a minimum number of poles—and possibly to make use of existing trolley or arc lamp posts. The lamps can be supported at great heights above the street, above the critical angle of the eyes. The small number of poles required for this system simplifies the installation of service wires, particularly in underground districts.

The principal defect noted in a large number of arc lamp systems, is the tendency to support the lamps too close to the ground. This is particularly objectionable on account of the fact that the glare effect produced by the bright light in the eye, causes a contraction of the pupil, which limits the amount of light entering the eye and no advantage is gained by a high intensity of illumination.

The ornamental post system is perhaps the most popular of the three systems classed as ornamental. There is a large number of post designs on the market, for from one to five light units. They are installed on both sides of the street, and comparatively close together. The lamps are supported in a pendant or inverted position, and are ordinarily supplied from an underground system. The lamps and globes are easy of access for renewals and cleaning. The maintenance cost is reasonably low, particularly where the series type of lamp is used. The illumination of the street, when units are properly spaced, is quite uniform, and the required intensity is readily secured by a proper selection of lamp sizes. Since the lamp posts are on the curb lines, the resultant effect is a street of great width.

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FIDELITY AND DEPOSIT COMPANY of Maryland
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The first cost of installation varies with local conditions and the type of post adopted, and the available source of energy supply.

The principal objection to this system is the large number of posts required. This is a particularly objectionable feature in districts where there exists also a large number of trolley, telephone and other service poles.

Summing up the general situation, it appears that no one system can be adopted as the best for all installations. Local conditions very largely determine the best system to be installed.

One of the very first questions that arises in connection with an installation of an ornamental street lighting system is "Who is to pay for it?" The standing committee on ornamental street lighting of the National Electric Lamp Association received reports from sixty-five systems. The installation and maintenance costs were paid for as follows:

	Installation	Maintenance
City	26	8
Merchants	23	18
Central Station	5	14
Property Owners	6	19
City, Property Owners and Tenants	1	..
Property Owners and Merchants	1	3
City and Central Station	1	1
City and Property Owners	1	1
City and Merchants	1	1

Contracts have been made with so many parties and combinations of parties that it has been impractical to standardize on any particular scheme. Local conditions almost entirely determine the contracting parties, depending to a great extent on who agitates the movement for better street lighting.

Ordinarily it is quite unsatisfactory for the company to have a contract with the property owners, merchants or tenants, individually. This form of contract involves so many people that there is a constant source of annoyance when any one becomes dissatisfied, moves away or for other reasons desires to be released from his portion of the expense.

Perhaps one of the best methods of handling this class of business is to secure contract with the city for the service, and if necessary a special tax assessment on property holders and merchants in the affected district can be made.

Plumbing a Science Now

"THE days of the master plumber, as the term master plumber was understood 30 years ago, seem to be passing," said a contractor the other day to the New York Sun. "In his place there has arrived the sanitary engineer. The master plumber was the individual who, clad in overalls, looked at an architect's drawing of a five- or six-story office building and estimated on the construction and the placing of the plumbing. In nine cases out of ten the work was poorly done, without due regard to sanitary conditions.

"With the evolution of the office building as understood in Manhattan today, came the evolution of the master plumber into the sanitary engineer. Modern methods of hygiene and an application of sound engineering principles have made possible the modern science of plumbing, and plumbing is a branch of engineering akin in importance to mechanical engineering. So that the sanitary engineer is a type of highly paid college graduated engineer, with various diplomas and other attachments to his name.

"With the enormous buildings in the business district of large cities it requires as much planning and designing for the plumbing as for the construction of the building itself, and the architect has to work hand in glove with the sanitary engineer to make his building a success. The comprehensiveness of the sanitary engineering business can fully be grasped by following the work of a small army of plumbers on a modern skyscraper. In a new building of 55 stories that is now in the course of construction, the sewer, water supply and drainage system are not the least important item in the construction of the building.

"All sewer connections in this building have to be carried to the public sewer; the plumbing fixtures above the basement floor have to have a gravity system of drainage and the sub-basement floor a system of drainage to an airtight sewage pump. Then again a system for the discharge of all rain water from the roof, balcony and other exposed parts of the building to the public sewer. Then separate systems for the water drains, ash elevator, steam blowoff, heating, refrigerating, sinks, drinking fountains, kitchen refuse and a thousand and one odd things.

"In addition to the above the plumber has to provide for a separate water supply system, inclusive of flushing systems, water cooling and filtering jackets for water cooling, vacuum cleaners and boiler feeds, and a system for the gas piping for kitchen cooking and emergency lighting, connections to different pumps and sewage tanks, and also a means of breaking the fall of the water from a height by traps and offsets."

Systems for Estimating

Editor The Architect and Engineer:

Can you advise me where I can secure a work that will assist me in accurately estimating the cost of a building?

A CONTRACTOR.

Hoyt Bros., the well-known San Francisco contractors have kindly furnished the following answer:

We have been in the general contracting business for about fifteen years and have found from our experience that there is only one way to accurately figure a building, and that is to take off all quantities of all kinds and get prices on

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the same and "price up the job." Sub-bids from reliable men are of great assistance and save a great deal of time and expense, although they should be handled with fairness and discretion. By discretion we mean that as far as possible you should give the sub-work to the lowest responsible sub-bidder. You should also avoid taking bids from sub-contractors in whom you have no confidence or who are not responsible or reliable.

We have found books a great assistance to us and have probably purchased all of any consequence that have ever been published but all of these have to be handled with care, as the prices given in them do not always fit the locality in which you are estimating work. The most valuable books which we have found are the following:

"Kidders-Architect & Builders' Pocket-Book."

"The New Building Estimator."

Both of these books being published by the David William Co., New York City. The only other books that we have ever received of much value, are the books written by H. G. Richey, a superintendent of construction on the United States public buildings. The books consist of the following and are published by W. T. Comstock, 23 Warren street, New York:

"A Handbook for Superintendents of Construction, Architects, Builders, and Building Inspectors."

"The Builder Mechanics' Ready Reference:"

Carpenters and Woodworkers' Edition.

Stone and Brick Mason's Edition.

Cement Workers' and Plasterers' Edition.

Plumbers, Steam-fitters, and Tinners' Edition.

"The Building Foreman's Pocket Book and Ready Reference."

We trust that this information will be of some service to you.

Yours very truly,

HOYT BROS.
By Frank L. Hoyt.

Dyer Bros. Accused

Dyer Brothers, contractors doing city work on the San Francisco Polytechnic high school, have been submitted to some sharp interrogations by the Board of Works upon the complaint that they had been working three riveters more than eight hours a day contrary to the city ordinance. Affidavits were filed to this effect by Tony and John Brodarch and Martin Godnik, who claimed that they had worked nine hours for the contractors driving rivets in the Golden West Iron works for the Polytechnic job.

Walter Dyer appeared for his firm and Supervisor Andrew J. Gallagher represented the union interests. Dyer denied that he had worked any of his men nine hours.

The commissioners decided to take the matter under advisement and to investigate the charge that threats had been made.

Breswell's Superior Graphite

This well-known home-product having stood all tests, has been adopted as the paint to be used exclusively for the steel on the Oakland City Hall. About 2,000 gallons will be required.

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New Home of Electric Appliance Company

Electric Appliance Company in New Quarters.

The Electric Appliance Company now occupies its own building at 807-809 Mission Street near the corner of 4th, San Francisco. This is a six story and basement reinforced concrete structure of fire proof construction, being one of the first of its kind to be erected after the fire. It had been vacant up to the time that the Electric Appliance Company became its tenant a month ago. It is one of the most substantially built store and loft buildings in San Francisco and is claimed to be both earthquake and fireproof. The company has taken a ten years' lease.

The Electric Appliance Company has been engaged in business in San Francisco for the past eight years and its business has practically doubled. While it is affiliated to a certain extent with the Electric Appliance Company of Chicago—the largest house in America—the San Francisco company is operated independently and under a local management entirely.

The company carries in stock a full line of high grade electrical supplies, wires and cables, weather proof line and house wires and automobile supplies. "Service" has been its slogan and probably is the secret of its success. Prompt attention is given to all orders, no matter how small, and the company is glad to receive country business as well as city trade.

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other floor coverings to be cleaned is obviated. Curtains, draperies, decorations, walls and ceilings are freed from dust deposits preventing the disagreeable appearance of dinginess and discoloration. It improves the sanitary condition of homes and buildings by removing the germ laden dust which settles on the fixtures and contents. No home is complete without an air cleaning system for it displaces the old fashioned broom and duster method of house cleaning. It is really just as necessary as modern plumbing or lighting systems.

Heretofore the cost of a genuine stationary cleaning plant has been almost prohibitive for the medium-size residence or bungalow, but the American Faucet Company of San Francisco, makers of the famous "Little Giant portable suction cleaners," have made it possible for every home to be equipped with a modern stationary vacuum or suction plant at a very low cost, and have produced the most perfect, durable and efficient stationary suction system at a price within the reach of every home builder. They are now installing their Little Giant stationary compound centrifugal suction system in residences of one and two stories at a cost of from $100 to $150 including full equipment of piping and renovating tools. It is thoroughly guaranteed in every respect. Speaking of the apparatus and its capacity, a member of the firm said:

"The Little Giant stationary suction cleaning system is positively the most economical as well as most efficient suction or vacuum machine in the market. It costs but two cents per hour to operate by electricity. Simplicity is the keynote of the design and the Little Giant system marks a new and radical departure in vacuum cleaning. The mechanism is of durable construction and occupies but small space and is installed in basement or cellar with two-inch piping leading to upper floors. It can be installed in houses already built as well as those under construction. Durability, efficiency, and economy are the essential points of the Little Giant cleaning system. The compound centrifugal fans are made of cast aluminum and attached direct to the shaft of the motor. There is nothing to break or get out of order, no complicated mechanism, no pistons, pumps, valves, eccentrics or gears, none of the wearing or breakable parts found in most vacuum machines. The motor is the highest grade manufactured and is specially designed for the Little Giant system.

"The machine requires practically no attention and no special knowledge of machinery. There is no complicated oiling system to cause unlimited trouble, bother and expense. The Little Giant stationary plant can be started or stopped by simply pressing the push button on any floor and when running at full speed makes less noise than a sewing machine and no vibration."

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By the Way

Some Industrial Information Worth the While

Larger Quarters for Marshall & Stearns

Marshall & Stearns, makers of the well known Portal Wall Beds, which have been installed in many of the largest apartments and hotels on the Pacific Coast, have found it necessary to enlarge their main sales and display room in the Phelan Building, San Francisco. The company now occupies nearly one-half the top floor of this commodious building. It has had fitted up some very handsome show rooms finished in mahogany, the furnishings being carried out in rich blue tones with carpets and draperies to match. The new quarters enable the firm to feature its different types of beds in a manner that must at once appeal to the prospective buyer. The arrangement is such that he is enabled to judge at once just how the bed will appear in his building. The beds are built not only from a utilitarian standpoint but to help dress a room. For example, when not in use, they serve as a mantle piece or sideboard. Where space is limited, and furniture is required, much valuable room is saved by the portal bed.

Among the San Francisco architects who have used the Marshall & Stearns bed with exceptional success is C. A. Meussdorffer, whose buildings are illustrated in this issue. Many of the structures shown are equipped with Marshall & Stearns beds, including the Riverside, Glasgow, Horstman and Stelling apartments.

The company has recently moved into its new factory on Folsom street near Third, and has equipped it with expensive machinery and every up-to-date appliance for turning out large orders on short notice. The new factory is practically double the size of the old one.

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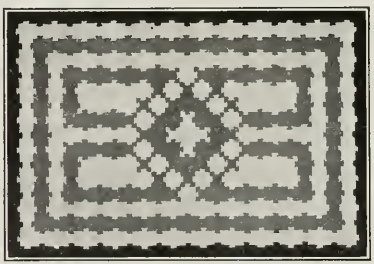

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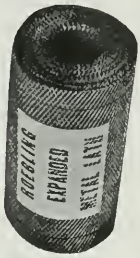
New General Offices

The general offices of the Standard Varnish Works for many years located at 29 Broadway, New York, have removed to their new office building at Elm Park, Port Richmond, Staten Island, N. Y.

Their new quarters will be in a new, modern building 110 feet long, 45 feet deep and 4 stories high. The first and second floors will be devoted entirely to office purposes, and will be fitted up in elaborate style. On the third floor there have been installed dining rooms for the accommodation of all the employees, and a complete printing and stationery department and janitor's quarters. The fourth floor has been fitted up and thoroughly equipped as an up-to-date research laboratory in charge of competent chemists.

This move will greatly facilitate the handling of business, for it has often been proved in business economics "where the factory is, there should the office be also."

THE ROEBLING CONSTRUCTION Co.'S



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A Money Saving Machine

One of the most interesting of the late inventions of machinery is the Planetary Mixer, invented by Capt. H. U. Prindle, and which has recently been acquired by the Enterprise Foundry Company of San Francisco. This machine is known as the Enterprise Planetary Mixer. The planetary motion is simply an old scientific principle applied to mechanism, so simple that it seems strange, indeed, that none of our inventors of machinery has applied it before.

The first machine turned out by the inventor for mixing hard-wall plaster, was bought by Callaghan & Manetta, and tried out on the Realty Syndicate building in Oakland in May of 1911. After using the machine one week, Mr. Callaghan stated to a representative of The Architect and Engineer, that if he could not buy another like it, he would not sell the machine for ten thousand dollars, because it not only gave a perfect mix, which other machines that he had used could not give, but that it turned out more plaster and saved him 20 per cent on material, as it enabled him to use more sand, and still get better results, because of the perfect mix; in addition to this, it saved the cost of three men's labor, so that the saving to his firm, by the Planetary Mixer, was more than thirty dollars each day that it was used. As this firm shortly after bought a second machine, it is evident that their satisfaction was complete.

Since the first Planetary Mixer was sold, it has been applied to every line of work imaginable, and in every case the proportion of saving, in time and in material, has been practically the same.

Among the builders who have recently installed Planetary Mixers are:

Smith & Johnson, 2 machines.
L. M. Scofield, 2 machines.
J. W. Carr, The Kompolite Co., West Coast Kalsomine Co., Gladding, McBean & Co., Geo. W. Werner, Berkeley, H. M. Johns, San Jose, and the San Diego Unit Brick & Tile Co.

Agents Wanted for Hunt Metal Corner Bead

The Hunt Metal Corner Company of 201 Devonshire street, Boston, wants to get in touch with live Pacific Coast agents to handle its materials. The company's sales manager writes us as follows: "What we want to accomplish on the Western Coast is to have a good substantial lot of live agents who will handle Hunt Corner Bead and carry it in stock. We realize that we are too far away to expect to get any amount of this business to be shipped from our factory. Under these circumstances perhaps it would be well to advertise the fact that we are after agents as well as showing up the metal corner."

The company's new catalogue contains splendid halftone illustrations of the Wells-Fargo Building, Portland, Oregon, and the National Realty Building at Tacoma, Washington. These are two large buildings where the Hunt Corner Bead has been placed throughout. The company has also placed a lot of its beads in the Federal buildings, San Francisco. In one of these buildings, the Customs House, Hunt Bead was furnished made from pure copper at a cost of about 15c per foot

Los Angeles Builders Exchange

The annual meeting of the Builders' Exchange of Los Angeles, resulted in the election of the following officers:

President—John H. Bean;
First Vice-President—P. J. Bolin;
Second Vice-President—John Hayes;
Third Vice-President—B. D. Kronnick;
Treasurer—John Griffin;
Directors—Unexpired term: R. D. Gould, R. W. Martin, D. S. Waterhouse, M. Kirkby, S. J. Brown. Newly elected for term of two years: J. A. Watt, H. G. Miller, C. V. Fowler, J. Kelch, W. E. Thornton

The Builders' Exchange membership now comprises 187. During the past year a large number of new members have been added and an aggressive campaign to increase the roll is to be continued.

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Making the Contractor a Present.

WHEN a sheet metal contractor cuts his price who benefits?

Suppose we take a few practical cases for analysis.

An Eastern contracting company secured a large building to erect in a Southern city. They used a $100,000 figure from a certain firm for the sheet metal work in making their estimate. Did the contracting firm say to the sheet metal man: "We won the contract on your figure; the job is yours?" What they did was to dicker—play one firm against the other. By the use of a few postage stamps and some maneuvering they had the work done for $90,000.

On the New Jersey coast a power house was being erected. The contractor took separate estimates for the different classes of work, using the lowest responsible bid on each for his own proposal to do the work. When he secured the contract the fine work began. The sub-contractors that helped him win the job, were patted on the back and told to figure again and "Get down in price." Combining the sheet metal, plumbing and tile work into one contract, and giving it to a party that did not originally figure the work the contractor saved $2,000.

A sheet metal contractor, in a certain city, was low on a contract, but did not know it; neither would he put himself in a position to find out when he was being played against himself. He always wanted everything in sight, but never did he want anything so badly as he wanted this particular contract. The tip was passed to him that he was $900 high, but the contractor favored him. He struck $900 from his bid, got the job, and the contractor was just that much richer.

An office building was being erected in a certain Western city. A contracting firm in a city one hundred miles away had the entire building. One firm figured that the **Cost**—no profit added—for doing the sheet metal and plumbing was $14,000, and were the low bidders. Another firm thought they could do it, profit and all, for that amount. After some delay the contractor said to the $14,000 firm: "We don't want to take this work away from your city, the building is being erected there, and sub-contractors in that city should have preference on the work. We want you to do the sheet metal and plumbing, but a firm in our home city is lower than your offer by $1000. Meet their price and the job is yours." They met the price. The profit side of the ledger on that job is marked in red ink to make it balance.

Is not the sheet metal trade almost tired of presenting their profits to somebody for the privilege of working? Master Sheet Metal Workers' Journal

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Brown Hoisting Machinery

The Brown Hoisting Machinery Company has issued another splendid catalogue describing its hoisting equipment. Following is an extract from the preface:

"The correct solution of the hoisting and conveying problem is a big factor in the success of any industrial business. It is a well-known fact today, that time and labor can be saved by the proper handling of one's raw and finished material. There are many different machines for handling material, some being more elaborate than others, and each best suited for certain work. In many cases, it is advisable to use a simple and inexpensive machine rather than a more elaborate one.

"The Brownhoist Equipment consists of all kinds of hoisting and conveying machinery. We have been building these machines for thirty-one years. In this pamphlet we show the Brownhoist pillar crane, hand wrecking crane, mast jib crane, bracket jib crane, pillar jib crane, stationary bridge crane, and transfer table. Any information not furnished here, will be sent on request."

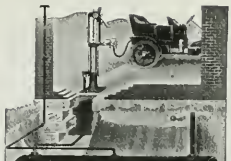
Big Plastering Contracts

One of the most successful plasterers in the city is George MacGruer of the Builders' Exchange, San Francisco. Contracts completed by him include the U. S. Government building at the Presidio and Fort Winfield Scott; Hobart Estate building Grant avenue, near O'Farrell street; Ellis Young building, Kearny street, near Post; Welch Estate, Fourth and Howard streets. Court Apartments, Golden Gate ave. and Larkin street; Kronenberg Apartments, N. E. Cor. McAllister and Franklin streets; Alta Casa Apartments, Powell and California streets; Hollschuckie Club, Bush and Mason streets.

Among the contracts which Mr. MacGruer has under construction are: The St. Luke's Hospital, Edward Beck Hotel, Bush street near Powell; Fred Finch Orphanage, Dimond, near Fruitvale; and the Crocker Estate office building at Market and Ecker streets, San Francisco.

Pacific Tank Company in New Quarters

The Pacific Tank Company which manufacturers among other things the well known and popular Pitcher Patent Disappearing Door, now maintains two large factories in San Francisco. In addition to the old plant which is still being operated on Berry street near Fourth, the company has taken possession of the big factory at the corner of Fifth and Bryant streets, having a frontage of 550 feet and a depth of 275 feet, together with a large lumber yard. Considerable new machinery has been installed and a large force is employed in the manufacture of the Pitcher Patents, water, oil and mining tanks, general planing mill work, mouldings, flag poles, etc.



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Constant investigation along the oil storage line for so many years has placed us in a position of authority on this subject. We have accumulated much information of importance to architects and contractors. If you are interested we will be glad to forward our complete set of bulletins No. 107 upon request.

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Assembling Department, San Francisco Metal Stamping and Corrugating Company's Plant

The Blaisdell Machinery Co. Line Comes to San Francisco.

The Blaisdell Machinery Company, of Bradford, Pa., manufacturers of vacuum cleaning systems, sewage ejectors, air and gas compressors and fuel oil burner systems, has opened a San Francisco office at 503 Market street.

The Blaisdell Machinery Company has been particularly energetic in the east and has installed vacuum cleaning and compressed air apparatus in the largest jobs and nearly all of the U. S. Government installations; they have only recently devoted their activities to this Coast and feel confident of great success in this locality.

The Blaisdell Vacuum Cleaning plants are all of the stationary type, being located in the basement of the building and serving the various floors by a piping system. The pumps are driven by motor or steam according to the convenience of the building.

The exhausters are all of the reciprocating, double acting type, which is the highest efficiency type known to mechanics, with mechanical oscillating valves, making the machines noiseless in operation.

The sewage ejectors are the Geo. D. Woodall patent with improvements that make these plants the best that can be constructed, combining both efficiency and durability.

The company is desirous of having architects and interested parties call on their representative for literature and is always glad to prepare piping plans and specifications through their main office gratis.

The company expects to get out some literature for exclusive use of architects in the near future, giving many points of interest on vacuum cleaning apparatus. It is planned to carry a stock of machines on the Coast in medium sizes, also a full line of spare parts in order to give all customers the best of service.

Blaisdell service is one of the main claims. This company looks after their machines after they are installed and makes it their business to see that every machine develops a perfect score and creates a booster of every purchaser.

Architectural Sheet Metal Plant

The accompanying full page plate shows the assembly room in the factory of the San Francisco Metal Stamping and Corrugating Company, 554-556 Treat Avenue, San Francisco. It is not generally known by architects that this company maintains a plant sufficient in size and equipment to take care of most anything in architectural sheet metal work. This firm makes a specialty of stamping and will work out any design in sheet metal ornamentation that the architect may prepare. The company has recently issued a very complete catalogue, profusely illustrated which it will be glad to mail free to any address upon application and mentioning this Magazine.

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Someone has made out a list of requirements that the ideal roofing material must measure up to.

Durable.

A time-tried, long-established material.

Easily applied.

Adaptable to any surface.

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Loses nothing in appearance with age.

Light in weight.

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Gives protection against lightning.

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Weatherproof.

The important point for the property owner is that one of the oldest and best-known roofing materials—tinplate—combines all these advantages.

Select your tin carefully—there is a lot of cheap stuff on the market—employ a good roofer, and then, as the years roll by, enjoy the comfort of a really first-class roof.

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World's Fair Notes

Owing to an accident, the giant dredger "John McMullen," of the San Francisco Bridge Company, which is filling in seventy-one acres of overflow land on the Panama-Pacific International Exposition site, was out of commission three or four days. The dredger has been in operation since April 12, and has been pumping silt from the bay at the rate of 12,000 cubic yards per day. Already a great portion of the overflow land has been filled, and the line of pipe from the dredger now extends half a mile over the Exposition site. It is figured that 10,000 cubic yards of silt is equivalent to 5,000 wagon loads. As soon as this land is filled the Buildings and Grounds Committee will immediately begin laying the pipes, conduits and all other necessary sanitary arrangements for the big Exposition.

* * *

The remaining houses on the Exposition site are being rapidly auctioned off and removed from the grounds. Within another month the 625 acres, extending from Fort Mason to the Presidio, will be bare of buildings and the fence enclosing the Exposition will be erected.

* * *

It is also planned to erect a $60,000.00 Service Building to house all the Departments of the Exposition. This will be the first building on the Exposition site. A police and fire department detail will be housed in this structure and an Emergency Hospital will also be a part of the pre-Expositon service.

* * *

The "Flying Legion" of the San Francisco Commercial Club plans to visit British Columbia in August next to exploit the Panama-Pacific International Exposition. A special train is to be provided to carry one hundred prominent citizens, and it is expected that Mayor Rolph and President Charles C. Moore of the Exposition will head the party. The visit is international in its scope and it is expected that the Canadian Government will be prevailed upon to make a big exhibition at the coming World's Fair.

* * *

Brigadier-General Erasmus N. Weaver, Chief of Artillery of the General Staff of the United States Army, has authorized President Moore to cable members of the "Commission Extraordinary to Europe" that they may announce to the French Government on their visit to France that Fort de Lesseps will be ceremoniously dedicated in 1915. This Fort is located on the Atlantic end of the Panama canal and was named in honor of Ferdinand de Lesseps, the eminent French engineer, who was the originator of the greatest engineering feat of modern times.

For the benefit of those who wish to make engagements to meet friends and relatives in this city during the progress of the 1915 Universal Exposition, the Department of Exploitation has prepared a 1915 calendar. With this calendar one is able to decide three years in advance just what days can be set aside for entertaining at the World's Fair.

It is a "winter to winter" Exposition. The ideal climate of California permits nine months and thirteen days. Visitors are guaranteed balmy breezes in the summer time and sunshine during the winter months.

The Exposition will open its doors on February 20, 1915, and close December 4, 1915.

* * *

The Department of Landscape Gardening of the Panama-Pacific International Exposition which has been organized under the supervision of John McLaren, Superintendent of Golden Gate Park, has twenty thousand trees, varying from seedlings to forty feet in height, which are ready for shipment to the Exposition site by the various nurseries of the State.

Within the next sixty days preparations for the Garden will be well under way. At the present time a nursery having an area of thirty acres is being prepared in the Presidio. Plans and specifications of the water supply of this nursery and the green and lath houses are prepared and contracts will be let shortly.

A New Coast Agency

Messrs. Rolph, Mills & Co., who have opened offices in the Western Metropolis Bank Building, are the exclusive agents for the Hydrex Felt and Engineering Co. of New. York. This line comprises, deafening felts, building papers, composition roofings and also the well established "Hydrex" Waterproofing Felt so well known and liked by architects and engineers.

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Boston, Philadelphia, Pittsburg, Chicago, St. Louis, San Francisco, Montreal

Developments in Cement Manufacture—White Cement

By E. B. SCOTT

It is difficult to realize how large a place cement occupies today in all our ideas of construction and how rapid this development has been. So accustomed have we become to concrete construction that we no longer look for it to represent something else, but accept it for itself. Everyone now realizes how horrible are the cement blocks shaped in imitation of ashlar-cut stone or concrete walls marked off into rectangles to represent granite block construction.

While concrete has thus made its own place among materials of construction, and no longer needs to be used as an imitation of something else in one regard it leaves something to be desired from an artistic standpoint, and that is the matter of color.

The natural color of concrete in spite of the fact that we have become accustomed to it, is not pleasing. Its tone is decidedly cold and harsh. In various ways architects have sought to get around this difficulty and a variety of paints and washes have been resorted to. It is not easy, however, to secure any degree of durability in this way, so the attention of chemists and cement manufacturers has been turned more and more to the problem of making a cement free from this defect, or as far as possible clear white.

As a matter of analysis all the elements that compose a standard Portland cement can be obtained in a perfectly white state and there is no reason why a Portland cement the equal in all respects of the ordinary gray cement should not be made from them. In practice this proved to be somewhat difficult and costly owing to the care required in the selection and treatment of the component materials, which had to be assembled from widely separated regions. Several foreign and Eastern companies succeeded in solving the problem, however, and when their products were put on the market they were welcomed, for they made possible splendid decorative work in concrete which before had not been attempted.

The cost of making white cement was of course considerably higher than that of ordinary gray cement, but its advantages were so manifest for a number of uses that it soon had a large market throughout the Eastern states. Among its important applications were the facing of concrete buildings, mortar of laying face bricks and tile, interior decoration, bathrooms, terazzo work and so forth, as well as for pergolas, statuary, and ornamental work generally.

The use of white cement on the Pacific Coast has been very limited. The Eastern price was reasonable enough, but when over $2.00 per barrel was added for freight charges, white cement became too much of a luxury for everyday use. Meanwhile, however, a careful reconnaissance was made throughout California in search of materials out of which to make white cement, and this painstaking search was crowned with success. So it now appears that we have right here on the Coast the necessary ingredients to make a cement that stands all the tests of a standard Portland cement and is as white and stainless as any of the Eastern brands. This result has been brought about by the Santa Cruz Portland Cement Co., at their Davenport mill, and great credit is due them for their enterprise in accomplishing it, as it will have an important bearing on the Pacific Coast architecture.

Employers' Liability.

On the subject of employers' liability, the Saturday Evening Post for May 4th has a summary of the "workmen's compensation act" of Washington state. It is quite different from the California regulation, in that it makes the State itself responsible for injuries to workmen while employed. Every employer in a machine industry where there is a constant liability to accident, pays into the State treasury a given percentage of his total yearly payroll, ranging from ten per cent in powder mills to one and one-half per cent in many little-hazardous trades. Out of that fund the State pays, immediately and without resort to courts, a fixed compensation for injury or death resulting from industrial accident. The State also pays the total cost of administering the fund, which amounts to no more than it formerly paid in court expenses for litigating damage claims. Every dollar that comes out of employers' pockets on account of accident or damages goes directly to the victims or the families of the victims of the accident; while under the old plan an average of 20 per cent was about all that the injured received of the total paid by employers, the balance being exhausted in attorneys' fees and court expenses, administration costs and insurance company's profits.

The Washington state idea may be a step toward paternalism in government, making the commonwealth the guardian of the maimed and the widowed and fatherless, but there are some features that commend it beyond the workings of the California law. For instance, there can be no suspicion that insurance companies are making capital out of the efforts to protect the laboring class. One of the purposes of government is to assure protection to the people, and when the policy that a government may engage in the insurance business loses its oddity, the plain, solid fact remains that it has a perfect right to do so; and the time may not be far distant when it will be considered not only a right, but a duty.

Such radical principles must, of course, be worked out gradually; but it is possible to contemplate a state fund against all forms of accidents to those who have others dependent upon them.

Metal Roofing as an Insurance Policy

Coincident with the bumper crops in many sections of the South and Southwest is the growing demand for metal roofing. The protective feature of the metal roof is becoming more manifest to those who own their own homes. The wide-awake farmer or landlord of today appreciates that metal roofs are a good sort of insurance policy against fire and other minor troubles with which all who live under shingle roofs are conversant. Rates for insurance are lower, too, on metal-covered dwellings.

A good metal roof is recognized as leak-proof, wind-proof, rust-proof and last, but by no means least, fire-proof. Those having metal roofs, metal shingles or metal siding on their homes or barns, and whose abode is miles from the nearest fire-fighting apparatus, feel secure to know they are at least better protected from that source of alarm which gives more trouble in the country than any other, destructive fires, than they would be if they had not protected themselves by using metal, where they formerly used wood.

Throughout the Southern States, statistics show that about 42 per cent of the fires start in the roof, which is a strong argument for the use of metal shingle. During the past ten years, many metal workers throughout that section of the country have been kept busy replacing the old wooden shingle with the modern metal type, and it is felt that there is good business ahead for the sheet-metal roofer who is sufficiently energetic to place before his customers the merits of metal roofing as a fire-protective material.—Roof Insurance Review.

In New Quarters

The Elevator Supply & Repair Company, who have increased the efficiency of elevator plants with their signal systems and equipments, invite inspection of their new ouarters, 807 Balboa Building, where they have a number of their devices on display, such as The Eggeler Guide Rail Lubricator, Rickett's Illuminated Threshold Fixtures, Mileage Recorders, and the Nortons Automatic Elevator Gate Closing Device together with a number of other ornamental fixtures used in connection with their signal systems.

The Southern Club Contract

This was satisfactorily executed by Joel Johnson, of the General Contractor's Association, who has, also, recently completed the flat building designed by Mr. Meussdorffer, on Pine street, between Jones and Leavenworth. Mr. Johnson had the general contract for the Colonado apartments, corner Larkin and Sacramento streets. His business is steadily increasing with leading architects.

Air Cleaning

A hand-book on air cleaning has been prepared and is now in use in the offices of architects who are applying modern principles in construction. If you haven't one we'll cheerfully send a copy free on request.

Its tables, curves, formulae and principles of air-cleaning engineering, with explanatory notes, are non-technical. It is as useful as Kent's hand-book for mechanical engineers or Trautwine's for civil engineers.

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San Francisco Chapter, A. I. A.

The regular monthly meeting of the San Francisco Chapter, American Institute of Architects, was held at the Tait-Zinkand Cafe, Thursday evening, May 16th.

Mr. Henry Hornbostel was present as a guest of the Chapter.

No report was received from the committee to meet with the General Contractors and the Building Trades Employers Associations, on account of the absence of Mr. Meyer.

The following communications were received and ordered placed on file: From the Home Industry League, copy of Resolution thanking the Chapter for its co-operation: from the National Conference on City Planning, copies of program, etc., of Fourth Conference to be held at Boston; from the American Federation of Arts, an appreciation of Mr. Francis Davis Millet, also letter regarding plan of financing the work of the Federation. from the American Institute, communications regarding the National Conference on City Planning and the appointment of a Committee on Public Information; and from the Philadelphia Chapter, A. I. A., letter and clippings in regard to the preservation of historic monuments.

On motion duly made, seconded and carried, the chair was empowered to appoint a committee to draw suitable resolutions on the death of Mr. Francis Davis Millet.

A motion was duly made, seconded and carried that it was the sense of the Chapter that all official communications emanating from the Chapter be sent in the name of the Chapter and signed by the President and Secretary.

Mr. Hornbostel favored the Chapter with some interesting remarks, which were listened to with appreciation.

Reg. U. S. Pat. Off.

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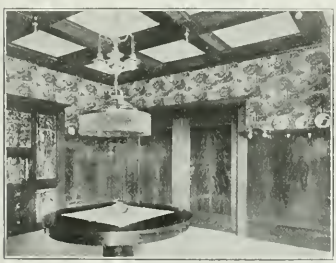

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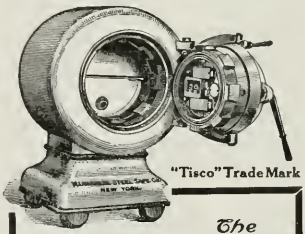

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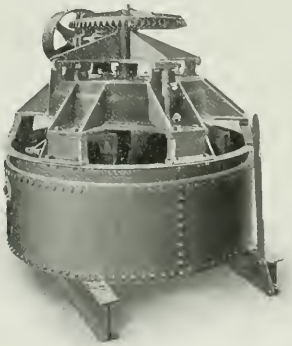

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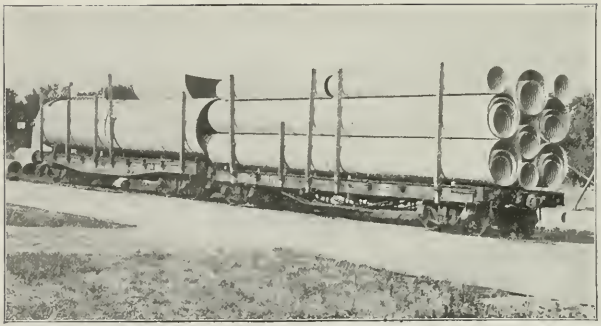

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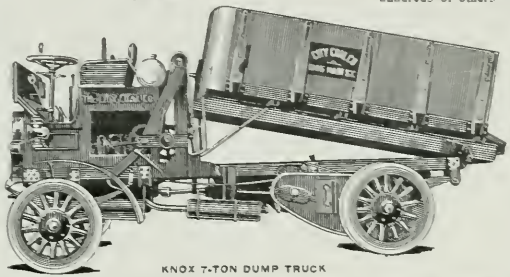

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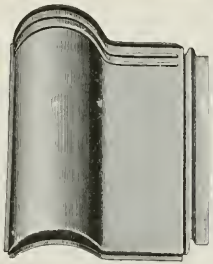

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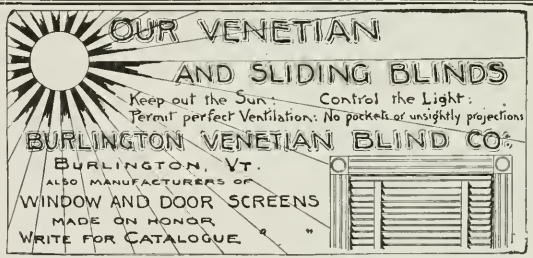

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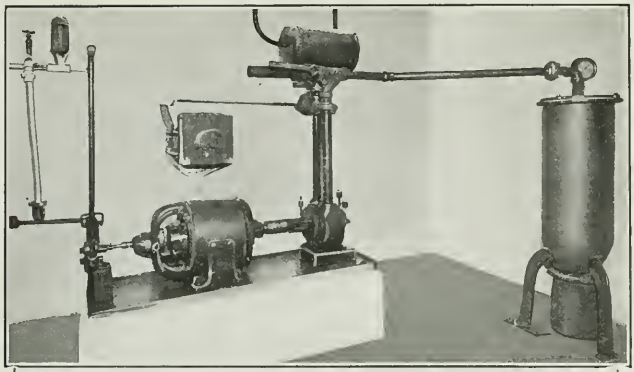

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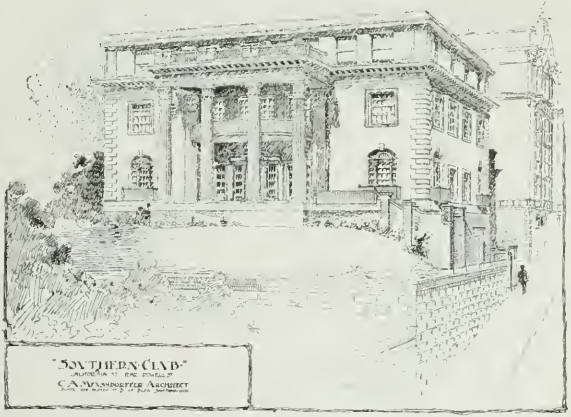

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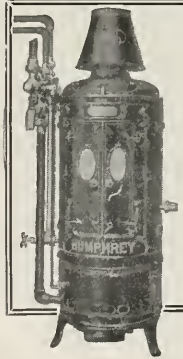

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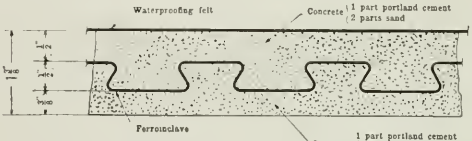

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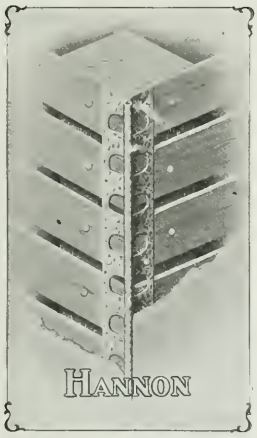

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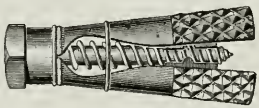

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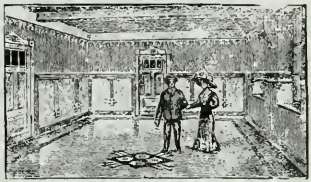

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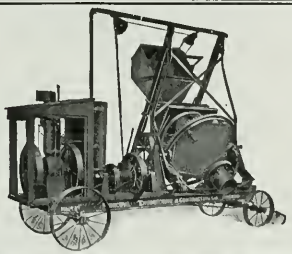

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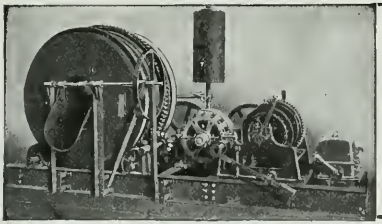

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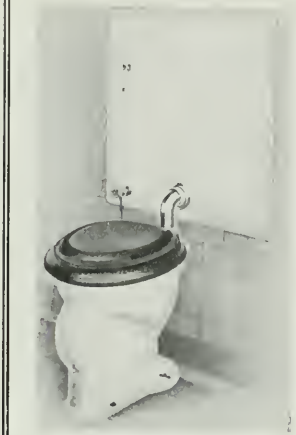

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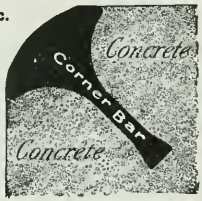

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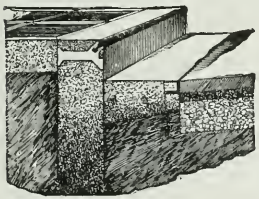

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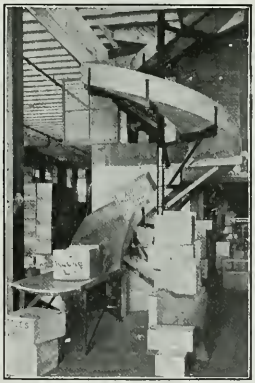

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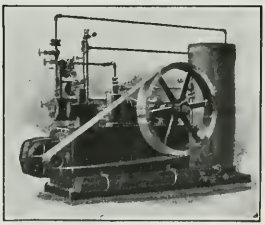

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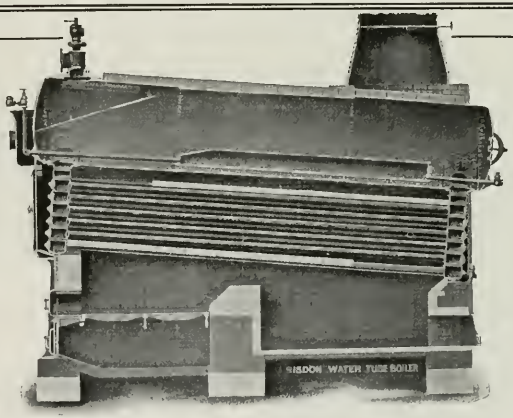

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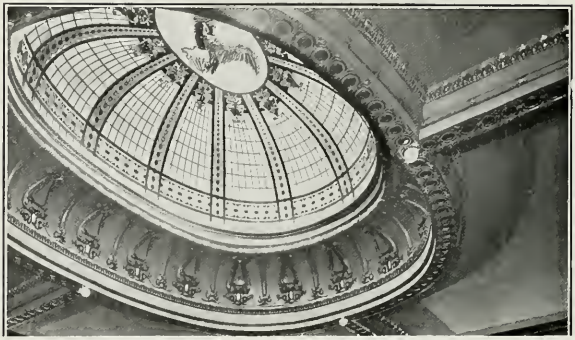

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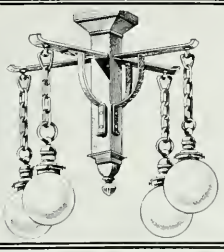

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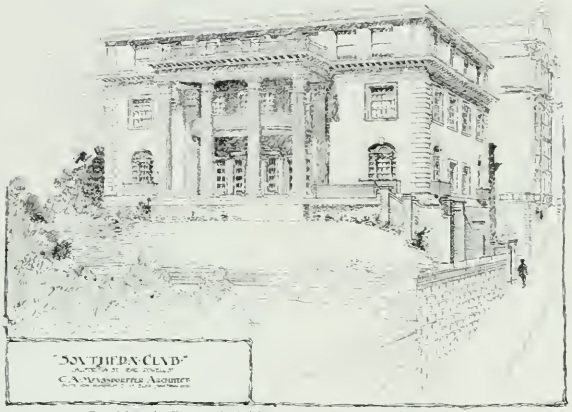

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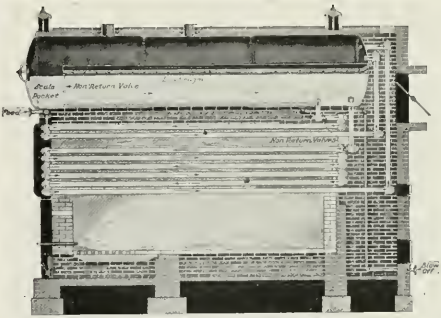

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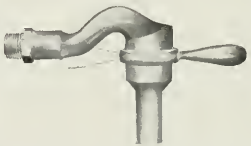

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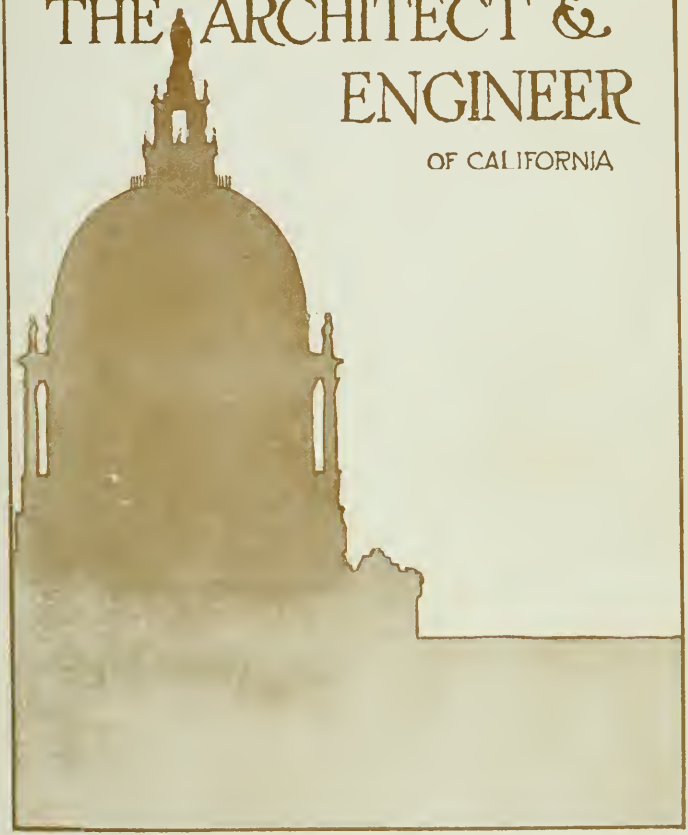

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1912

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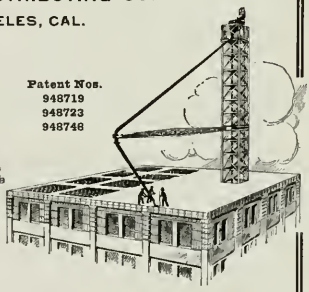

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H. D. Samuel Co....Monadnock Bldg., S. F.
WESCO—West Coast Kalsomine Co., 110 Hansford Bldg., S. F.

DOORS—FREIGHT ELEVATOR
"Cross" Counterbalance Automatic, Boyd & Moore, Agents.....356 Market St., S. F.

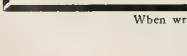
DOOR HANGERS
Pitcher Hanger, sold by Pacific Tank Company.....231 Berry St., S. F.
Reliance Hanger, sold by Sartorius Co., S. F.; D. F. Fryer & Co., Louis R. Bedell, Los Angeles, and Portland Wire & Iron Works.

DOOR OPENER
G. Rischmuller, Builders' Ex., and 3442 19th St., S. F.

DOORS—DISAPPEARING
Pacific Tank & Pipe Co.,231 Berry St., S. F.

DOORS—SCREEN
Higgin Mfg. Co., represented by Mailler Searles.....817 Monadnock Bldg., S. F.

Specify a California Marble...



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ARCHITECTS' SPECIFICATION INDEX—*Continued*

DOORS AND SHUTTERS
Kinnear Steel Rolling Doors and Shutters, Lilley & Thurston Co., Rialto Bldg., S. F.

DOORS—WAREHOUSE
"Cross" Horizontal Folding Doors, Boyd & Moore, Agents.....356 Market St., S. F.
Wells & Spencer Machine Company, 173 Beale St., S. F.

DUMB WAITERS
Energy Dumb Waiters, Boyd & Moore, Agents.....356 Market St., S. F.

ELECTRICAL CONTRACTORS
Butte Engineering Co..683 Howard St., S. F.
Central Electric Co..185 Stevenson St., S. F.
Davis & Doman Electric Co., 1220 Webster St., S. F.
Electric Appliance Co., 807 Mission St., S. F.
Jno. G. Sutton Co.....243 Minna St., S. F.
Pacific Fire Extinguisher Company, 507 Montgomery St., S. F.

ELEVATORS
Otis Elevator Company, Stockton and North Point, S. F.
Van Emon Elevator Co..54 Natoma St., S. F.
Wells & Spencer Machine Co., 173 Beale St., S. F.

ELEVATOR CARS
Cleveland Art Metal Co., Boyd & Moore, Agents .....356 Market St., S. F.

ELEVATOR DOORS
"Cross" Elevator Doors, Boyd & Moore, Inc., Agents.....356 Market St., S. F.
Dahlstrom Metallic Door Co., Rialto Bldg., S. F.

ELEVATORS, SIGNALS, FLASHLIGHTS AND DIAL INDICATORS
Elevator Supply & Repair Co., 593 Market St., S. F.

ENGINEERS
F. J. Amweg.....700 Marston Bldg., S. F.
W. W. Breite.....Clunie Bldg., S. F.
J. C. Hurley ..... 12 Geary Street, S. F.
Hunter & Hudson, Monadnock Bldg., S. F.
Rickon & Ehrhart, 1859 Geary St., S. F.
Van Sant-Houghton Co., 503 Market St., S. F.

EXPRESS CALL SYSTEM
Elevator Supply & Repair Co., 593 Market St., S. F.

FIRE ESCAPES
Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, etc. Phone Market 1374; Home, J 3435. 370-84 Tenth St., S. F.

FIRE EXTINGUISHERS
Marshall & Schimpf.....Clunie Bldg., S. F.
Pacific Fire Extinguisher Co., 507 Montgomery St., S. F.

FIREPLACE DAMPER
Head, Throat and Damper for open fireplaces, Colonial Fireplace Co., Chicago.
(See advertisement for Coast agencies.)

FIREPROOFING
Gladding, McBean & Company, Crocker Bldg., S. F.
Los Angeles Pressed Brick Co., Frost Bldg., L. A.
Roebling Construction Co., Crocker Bldg., S. F.

FIRE PROTECTION—SPRINKLER SYSTEM
Jno. G. Sutton Co....243 Minna St., S. F.
Pacific Fire Extinguisher Company, 507 Montgomery St., San Francisco; Branch Offices, Portland, Seattle and Spokane.
Marshall & Schimpf.....Clunie Bldg., S. F.

FIXTURES—BANK, OFFICE, STORE, ETC.
Burlingame Cabinet Works, 509-511 Sixth Street, San Francisco
A. J. Forbes & Son..1530 Filbert St., S. F.
Fink & Schindler.....218 13th St., S. F.
T. H. Meek Company..1157 Mission St., S. F.
C. F. Weber & Co., 365 Market St., San Francisco and 210 N. Main St., Los Angeles, Cal.

FLOOR TILING
Watson Mantel & Tile Co., 457 Market St., S. F.

FLOOR VARNISH
Bass-Hueter and S. F. Pioneer Varnish Works, 816 Mission St., S. F.
R. N. Nason & Co...151 Potrero Ave., S. F.
Standard Varnish Works, Chicago, New York and S. F.
Worden-Meeker Varnish Works, S. F. and Oakland

FLOORS—CORK
Nonpariel Cork Tiling, David E. Kennedy, Inc., N. Y. Distributor for the Pacific Coast, G. H. Freear, Phelan Building, S. F.

FLOORING—MAGNESITE
Mallott & Peterson, 682 Monadnock Bldg., S. F

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit, Bowser & Co. .....612 Howard St., S. F.

GARBAGE BURNERS
Water Heating Garbage Burners, sold by Cal. Hydraulic Eng. & Supply Co., 70 Fremont St., S. F.

GARBAGE CHUTE
Bill & Jacobsen.....524 Pine St., S. F.

GLASS AND GLAZING
California Plate and Window Glass Company, 864 Mission St., San Francisco.
W. P. Fuller & Co., San Francisco, Los Angeles and Portland.

GRAPHITE
Detroit Graphite Co..301 Hearst St., S. F.

GRAVEL, SAND AND CRUSHED ROCK
Bay Development Co.....153 Berry St., S. F.
California Building Material Co., Pacific Bldg., S. F.
Del Monte White Sand, sold by Pacific Improvement Co.....Crocker Bldg., S. F.
Grant Gravel Co.....87 Third St., S. F.
I. F. Holland.....Army St. Wharf, S. F.
Natomas Consolidated, Peoples' Savings Bank Bldg., Sacramento

HARD WALL PLASTER
Empire Hard Wall Plaster, sold by Pacific-Portland Cement Co., Pacific Bldg., S. F.
Reno Hard Wall Plaster, sold by Western Building Material Co., 430 California St., S. F.

HARDWARE
Russwin Hardware, Joost Bros., S. F.

HARDWOOD FLOORING
Boyd & Moore.....356 Market St., S. F.
Dieckmann Hardwood Co., Beech St., cor. Taylor, S. F.
E. A. Howard & Co., 20 Howard St., S. F.
Strable Mfg. Co.....Oakland, Cal.
Parrott & Co.....320 California St., S. F.
White Bros.. Cor. Fifth and Brannan Sts., S. F.
Hardwood Interior Co., 554 Bryant St., S. F.

HARDWOOD LUMBER
Dieckmann Hardwood Co., Beach St., cor. Taylor, S. F.
Parrott & Co.....320 California St., S. F.
Strable Mfg. Co., First St., betw. Washington & Clay, Oakland.
White Bros., Cor. Fifth and Brannan Sts., S. F.

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TELEPHONES: KEARNY 664
HOME J 1124

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HARDWOOD VENEER PANELS AND DOORS
E. A. Howard & Co....Howard St., S. F.
HEATERS—AUTOMATIC
Hoffman Heater, sold by Holbrook, Merrill & Stetson, San Francisco and Los Angeles.
Humphrey Co.,
565 N. Rose St., Kalamazoo, Mich.
Pittsburg Water Heater, sold by Thos. Thieben & Co. .....667 Mission St., S. F.
HEATING ENGINEERS
General Engineering Co.,
231-3-5 Natoma St., S. F.
HEATING EQUIPMENT—VACUUM, ETC.
C. A. Dunham Co., Marshalltown, Iowa, Western Division Office,
Monadnock Bldg., S. F.
Guernsey & Wheeler, ...Rialto Bldg., S. F.
Marshall & Schimpf.....Chmie Bldg., S. F.
HEATING AND VENTILATING
Atlas Heating & Ventilating Co.,
Fourth and Freelon Sts., San Francisco.
Fess System Co.....220 Natoma St., S. F.
Guernsey & Wheeler....Rialto Bldg., S. F.
Gilley-Schmid Co., Inc.,
Thirteenth and Mission Sts., S. F.
Hoffman & Meusser,
1129-1131 Howard St., San Francisco.
J. C. Hurley..... 12 Geary Street, S. F.
S. T. Johnson Co.....1334 Mission St., S. F.
Mangrum & Otter, Inc., 507 Mission St., S. F.
H. W. Moffat, ...Pacific Bldg., S. F.
Royal Heating Co....280-82 Minna St., S. F.
Jno. G. Sutton Co....243 Minna St., S. F.
Pacific Blower & Heating Co.,
17th St., betw. Mission and Valencia, S. F.
Pacific Fire Extinguisher Company,
507 Montgomery St., S. F.
Petersen-James Co....710 Larkin St., S. F.
HINGES
Stanley's Ball-Bearing Hinges, Stanley Co.,
New Britain, Conn.
HOTELS
The Angelus, Loomis Bros.....Los Angeles
ICE MAKING MACHINES
"The Wizard," sold by the De Laval Dairy Supply Co., Drumm and Sacramento streets, San Francisco.
INGOT IRON
American Rolling Mill Co., Middleton, Ohio.
California Corrugated Culvert Co.,
5th and Parker Sts., West Berkeley.
INLAID FLOORS
Hardwood Interior Co., 554 Bryant St., S. F.
INSPECTIONS AND TESTS
R. E. Noble & Co., Humboldt Bank Bldg., S. F.
Robert W. Hunt & Co.,
418 Montgomery St., S. F.
Smith, Emery & Co. Inc.,
651 Howard St., S. F.
INSULATING MATERIALS
Armstrong Cork Co..... Pittsburg, Pa.
INSURANCE
David Duncan.....340 Sansome St., S. F.
INTERIOR DECORATING
The Tozer Company, 228 Grant Ave., S. F.
JOIST HANGERS
Western Builders' Supply Co.,
680 Mission St., S. F.
KITCHEN BOILERS
Victor Boiler Co.,
Fourth and Washington Sts., Oakland
KITCHEN EQUIPMENT
John G. Ils & Co....855 Mission St., S. F.
LANDSCAPE ENGINEERS
MacRorie & McLaren Co.,
Westbank Bldg., S. F.
LIME
J. P. Holland.....Army St. Wharf, S. F.
Holmes Lime Company,
Monadnock Bldg., S. F.
LIGHTING FIXTURES
Adams & Hollopeter....745 Mission St., S. F.
Bauer Fixture Co.....49-55 Jones St., S. F.
LIGHT, HEAT AND POWER
Pacific Gas & Elec. Co..445 Sutter St., S. F.
LOCKERS—METAL
Hart & Cooley Co., Boyd & Moore, Agents,
356 Market St., S. F.
LUMBER
Sunset Lumber So.....Oakland, Cal.
Santa Fe Lumber Co.,
Seventeenth and De Haro Sts., S. F.
MANTELS
Mangrum & Otter ....561 Mission St., S. F.
S. Ginsberg & Co.....1029 Larkin St., S. F.
Watson Mantel & Tile Co.,
457 Market St., S. F.
Thos. F. Rigney, ...9 City Hall Ave., S. F.
MARBLE
Columbia Marble Co...268 Market St., S. F.
METAL AND STEEL LATH
Baker & Hamilton, 433 Brannan St., S. F.
Roebling Construction Co.,
Crocker Bldg., S. F.
L. A. Norris & Co., Monadnock Bldg., S. F.
METAL CEILINGS
Berger Mnfg. Co....1120 Mission St., S. F.
San Francisco Metal Stamping & Corrugating Co.....Treat Ave. and 19th St., S. F.
METAL DOORS AND WINDOWS
Capitol Sheet Metal Works,
1927 Market St., S. F.
Dahlstrom Metallic Door Co., Western office,
Rialto Bldg., S. F.
S. Ginsberg & Co., 1029 Larkin St., S. F.
Metal Window Screens, Mailler Searles, Agt.,
817 Monadnock Bldg., S. F.
Rulofson Metal Window Works,
Eighth and Brannan Sts., San Francisco.
Waterhouse & Price..... 59 Third St., S. F.
Fink & Schindler Co., 218 13th St., S. F.
Zahner's Monarch Hollow Metal Doors and Trim, Boyd & Moore, Inc., Agents,
356 Market St., S. F.
METAL SHINGLES
Meurer Bros., J. A. McDonald, Pacific Coast Agent.... Third, near Townsend St., S. F.
San Francisco Metal Stamping & Corrugating Co.....Treat Ave. and 19th St., S. F.
L. B. Hooker Co., 1530 Howard St., S. F.
MIXERS
Enterprise Foundry Co., 200 2d St., S. F.
OIL BURNERS
S. T. Johnson Co...1334 Mission St., S. F.
Fess System Co.....220 Natoma St., S. F.

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School Desks

ARCHITECTS' SPECIFICATION INDEX *Continued*

OPERA CHAIRS
C. F. Weber & Co....365 Market St., S. F.
Whitaker & Ray-Wiggin Co., San Francisco and Los Angeles.

ORNAMENTAL IRON AND BRONZE
J. G. Braun.....Chicago and New York
California Artistic Metal and Wire Company, San Francisco.
Standard Company, represented by Mailler Searles.....817 Monadnock Bldg., S. F.
Standard Iron Works, 235-39 Shipley St., S. F.
Golden Gate Structural & Ornamental Iron Works .....1479 Mission St., S. F.
C. J. Hillard Company, Inc., 211-215 8th St., S. F.
West Coast Wire & Iron Works, 861-863 Howard St., S. F.

PAINT FOR STEEL STRUCTURES
The American Bitumastic Enamels Company, Hill, Hubbell & Co., Pacific Coast Agents, Fife Bldg., S. F.
Buswell's Steel and Concrete Paints, Oakland, Cal.
Detroit Superior Graphite Paint, manufactured by Detroit Graphite Company. C. W. Pike Company, Coast Sales Agents, 22 Battery St., S. F.
Glidden's Acid Proof Coating, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.

PAINT FOR CEMENT
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.), [See adv. in this issue for Pacific Coast agents.]
Glidden's Liquid Cement, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
The American Bitumastic Enamels Company, Hill, Hubbell & Co., Pacific Coast Agents, Fife Bldg., S. F.
Vitrolite Cold Water Paint, sold by Boyd & Moore.....356 Market St., S. F.
WESCO—West Coast Kalsomine Co., 110 Hansford Bldg., S. F.
Worden-Meeker Varnish Co., S. F. & Oakland.

PAINTS, OILS, ETC.
Bass-Hueter Paint Company, Mission, near Fourth St., S. F.
R. N. Nason Company.....San Francisco
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Glidden Varnish Co., Cleveland, Ohio, represented by Whittier-Coburn Co., S. F. and Los Angeles
Paraffine Paint Co....38-40 First St., S. F.
Standard Varnish Works, represented by W. P. Fuller & Co., S. F. and Los Angeles.
Wesco—West Coast Kalsomine Co., 110 Hansford Bldg., S. F.
Worden-Meeker Varnish Co., S. F. & Oakland.

PHOTO ENGRAVING
California Photo Engraving Co., 121 Second St., S. F.

PHOTOGRPHY
Arthur J. Brunner Co.,..47 Kearny St., S. F.
Gabriel Moulin.....153 Kearny St., S. F.

PIPE—CORRUGATED INGOT IRON
California Corrugated Culvert Company, Los Angeles and West Berkeley.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA.
N. Clark & Sons, 112 Natoma St., San Francisco
Gladding McBean & Co., Crocker Bldg., S. F.
Pacific Sewer Pipe Company, I. W. Hellman Bldg., Los Angeles
Steiger Terra Cotta and Pottery Works, Mills Bldg., S F.

PLASTER
Empire Plaster, The Nevada Gypsum Co., Pacific Bldg., S. F.

PLASTER WALL BOARD AND WOOD FIBRE
Mound House Plaster Co., Monadnock Bldg., S. F.

PLASTERING CONTRACTORS
D. Ross Clarke.....708 Pacific Bldg., S. F.
Geo. MacGruer....319 Mississippi St., S. F.

PLUMBING
J. E. O'Mara. .....443 Minna St., S. F.
Jno. G. Sutton Co.....243 Minna St., S. F.
Peterson-James Co.....710 Larkin St., S. F.
The J. Looney Company, 85 City Hall Ave., San Francisco
Wetzel & Grass.....105 Fulton St., S. F.
Wittman, Lyman & Co., 315 Polk St., S. F.

PLUMBING FIXTURES
Crane Co....Second and Brannan Sts., S. F.
Jno. Douglas Co....571 Mission St., S. F.
Haines, Jones & Cadbury Co., 851-859 Folsom St., S. F.
P. F. Howard Co., Second and Folsom Sts., S. F.
Louis Lipp Company, Winton Place, Ohio. Pacific Coast Office, 693 Mission St., S. F.
Mark-Lally Co..First and Folsom Sts., S. F.
J. L. Mott Iron Works, D. H. Gulick, selling agent .....135 Kearny St., S. F.
N. O. Nelson Mfg. Co., 978 Howard St., S. F 406 E. 4th St., Los Angeles
Geo. H. Tay Company, 617 Mission St., S. F.

PLUMBING MATERIALS
Mark-Lally Co., First and Folsom Sts., S. F.

PLUMBERS' SUNDRIES
Orca Sanitary Toilet Seat, manufactured by Orca Mfg. Co., 700 Hooker & Lent Bldg., S. F.

PLUMBING SUPPLIES
Crane Company, 2d and Brannan Sts., S. F.
P. F. Howard Co., 2d and Folsom Sts., S. F.
N. O. Nelson Mfg. Co., 978 Howard St., S. F.

POTTERY
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.

GEORGE PETERSON G. HAZELTON WILSON

PETERSON & WILSON

JOBBING, STORE AND OFFICE FITTING — *Contractors and Builders* — TELEPHONE FRANKLIN 4677

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617 Mission St., S. F. Just back of the Palace Hotel

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PULLEYS, SHAFTING, GEARS, ETC.
Meese and Gottfried Company.....San Francisco, Seattle, Portland and Los Angeles

PUTTY
F. P. Virgin Co.....713 Brannan St., S. F.

ROAD MACHINERY
Iroquois Iron Works (Barber Asphalt Company) .....Head Bldg., S. F.

RAILROADS
Southern Pacific Co.....Flood Bldg., S. F.
Western Pacific Railroad..Mills Bldg., S. F.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
Lilley & Thurston Co., Rialto Bldg., S. F.
C. F. Weber & Co.....365 Market St., S. F.

ROOFING AND ROOFING MATERIALS
Biturine Co. of America,
24 California St., S. F.
J-M Asbestos Roofing, sold by H. W. Johns-Manville Co., Agencies in all the principal West Coast cities.
F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co.,
Rialto Bldg., S. F.
Mallott & Peterson,
682 Monadnock Bldg., S. F.
Marsh Brothers .....Call Bldg., S. F.
Meurer Bros. Co.....630 Third St., S. F.
L. B. Hooker Co..1530 Howard St., S. F.
"Ferroinclave," the Brown Hoisting Machinery Co., Coast Agent, Chas. A. Levy,
Monadnock Bldg., S. F.
Fibrestone & Roofing Co.,
Mutual Savings Bank Bldg., S. F.
Genasco Ready Roofing, sold by Parrott & Co.....320 California St., S. F.
Hydrex Felt and Compound, sold by Rolph, Mills & Co.,
Western Metropolis Bank Bldg., S. F.
Mackenzie Roof Co., 425 15th St., Oakland.
Meurer Bros. Co., A. H. McDonald, Coast Representative.....630 Third St., S. F.
H. D. Samuel Company,
1054 Monadnock Bldg., S. F.
United Materials Co.... Balboa Bldg., S. F.
Western Builders' Supply Co.,
680 Mission St., S. F.

ROOFING TIN
N. & G. Taylor Co.....Philadelphia, Pa.
J. A. Drummond, 422 Chronicle Bldg., S. F.

RUBBER TILING AND MATTING
New York Belting & Packing Co.,
129 First St., S. F.

SAFES
Howe Scale Company, 333 Market St., S. F.

SAND
Del Monte White Sand, sold by Pacific Improvement Company, Crocker Bldg., S. F.
J. P. Holland.....Army St. Wharf, S. F.

SANDSTONE BRICK
Sacramento Sandstone Brick Co.,
39 Stevenson St., S. F.

SASH CORD
Puritan Sash Cord Company. (For Coast Agents, see advertisement.
Samson Cordage Works, Manufacturers of Solid Braided Cords and Cotton Twines
88 Broad St., Boston, Mass.
Silver Lake A Sash Cord, represented by Sanford Plummer,
149 New Montgomery St., S. F.

SCENIC PAINTING—DROP CURTAINS, ETC.
The Edwin H. Flagg Scenic Company,
1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES
C. F. Weber & Co....365 Market St., S. F.
512 S. Broadway, Los Angeles.
Whitaker & Ray-Wiggin Co., 776 Mission St., S. F.; 209 E. Seventh St., Los Angeles.

SCREENS—WINDOW AND DOOR
Higgin Mfg. Co., represented by Mailler Searles.....817 Monadnock Bldg., S. F.
Invisible Roll Screen Company, Mailler Searles, Agt....817 Monadnock Bldg., S. F.

SHEATHING AND SOUND DEADENING
"Hydrex" Waterproof Building Papers. "Hydrex" "Sanifior" Deafening Felt, manufactured by Hydrex Felt & Eng. Co., N. Y. and sold by Rolph, Mills & Co.,
Metropolis Bank Bldg., S. F.
Neponset Waterproof Building Papers, Neponset Florian Sound Deadening Felt, manufactured by F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co.....Rialto Bldg., S. F.
Samuel Cabot Mfg. Co., Boston Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

SHEET METAL WORK
Berger Mfg. Co.....1120 Mission St., S. F.
Capitol Sheet Metal Works,
1927 Market St., S. F.
Dunlevy & Gettle....79 City Hall Ave., S. F.
Hibernia Sheet Metal Works,
219 Seventh St., S. F.
L. B. Hooker Co., 1530 Howard St., S. F.

SHEET COPPER
C. G. Hussey & Co....565 Folsom St., S. F.

SHINGLE STAINS
Cabot's Creosote Stains, sold by Waterhouse & Price, San Francisco, Los Angeles and Portland.

SKYLIGHT CORNICES, ETC.
Hibernia Sheet Metal Works,
219 Seventh St., S. F.
L. B. Hooker Co., 1530 Howard St., S. F.

SPIRAL CHUTE
The Haslett Spiral Chute Co.,
310 California St., S. F.

STEAM FITTERS
Petersen-James Co....710 Larkin St., S. F.

STEEL AND IRON—STRUCTURAL
Boyd & Moore.....356 Market St., S. F.
Central Iron Works..621 Florida St., S. F.
Enterprise Foundry Co.,
200 Second St., S. F.

W F AVERY, PROP. PHONE KEARNY 5319

STANDARD IRON WORKS

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Penetrating Stains
Wood Oil Stains
Waxed Finishes
Wheeler's Paste Filler

See Page 19

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An outside durable Fire Retarding
Cold Water Paint
White and Colors
for both
Wood and Metal

Glidden's
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VARNISHES

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M. P. Durable Floor

Refer to page 18

Glidden's
ADVANCED FINISHES

Concrete Floor Dressing
Liquid Cement Coating
Waterproof Flat Wall Finish
White Cement Enamel
French Caen Stone Finish

Refer to page 18

WHITTIER COBURN CO.'S
Shingle Stains

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CALIFORNIA

ARCHITECTS' SPECIFICATION INDEX—*Continued*

STEEL AND IRON—STRUCTURAL—Cont'd.
Judson Manufacturing Company,
819 Folsom Street, San Francisco.
Mortenson Construction Co.,
19th and Indiana Sts., S. F.
J. L. Mott Iron Works, D. H. Gulick, Agt.,
135 Kearny St., S. F.
Pacific Rolling Mills,
17th and Mississippi Sts., S. F.
Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, Etc. Phone Market 1374; Home, J 3435...370-84 Tenth St., S. F.
Schrader Iron Works .....San Francisco
Union Iron Works..... San Francisco
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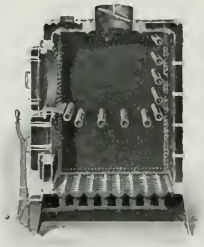

Interior Views of Type D

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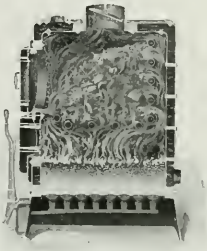

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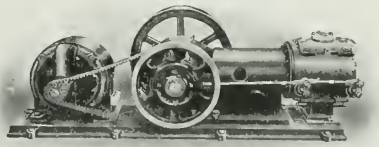

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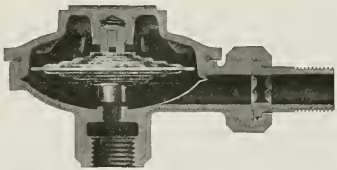

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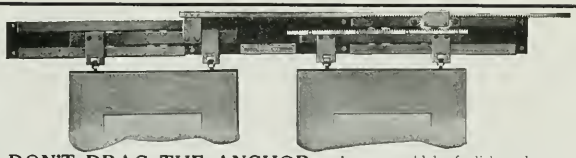

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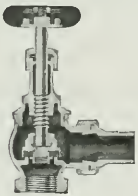

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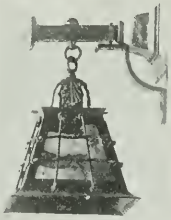

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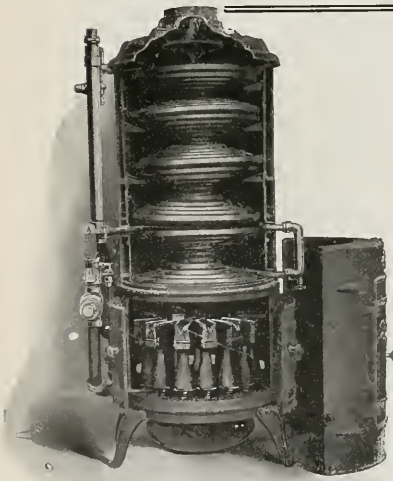

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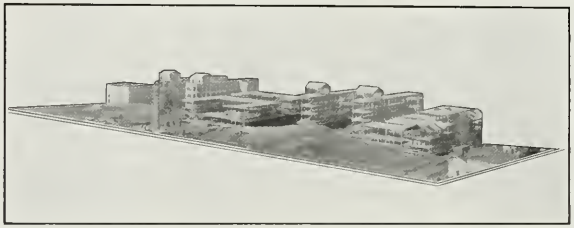

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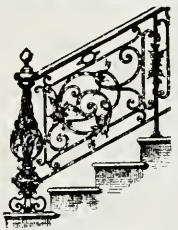

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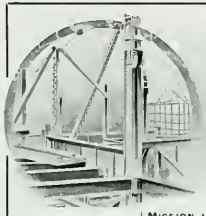

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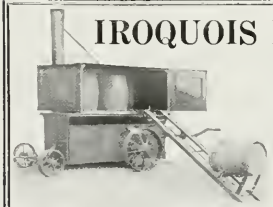

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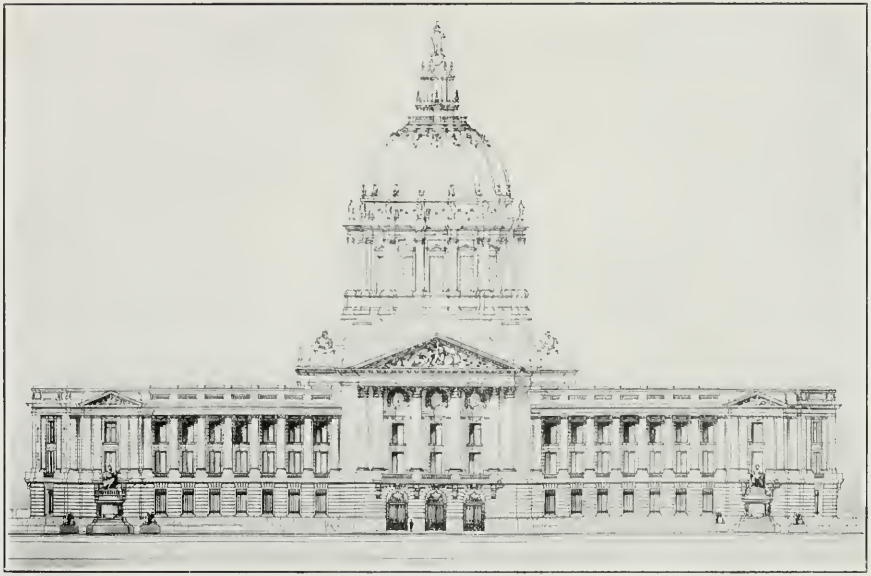

EAST ELEVATION, SAN FRANCISCO CITY HALL. AWARDED FIRST PRIZE
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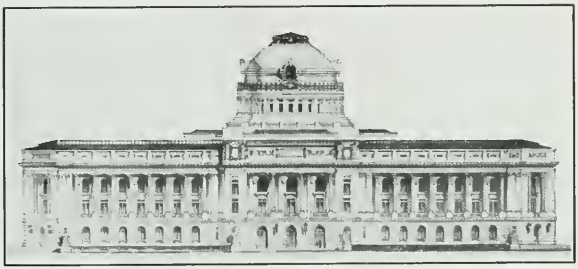

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The San Francisco City Hall Competition†

How the Successful Architects Arrived at Their Solution

By JOHN BAKEWELL, Jr.*

IN the solution of an Architectural problem it is necessary, first to study the uses to which the building is to be put, and then to find that arrangement of plan which meets the requirements in the most simple and direct manner; a plan that is organic, in which the component parts are tied together by the simplest possible system of circulation.

These component parts should be put in their proper relation both as to location, and as to size and at the same time the problems of lighting, of grouping into departments, etc., should be taken care of.

Then above all the plan should express some real Architectural idea, and it is very difficult to achieve the other qualities such as simplicity, directness and clarity, without this unifying idea or feature.

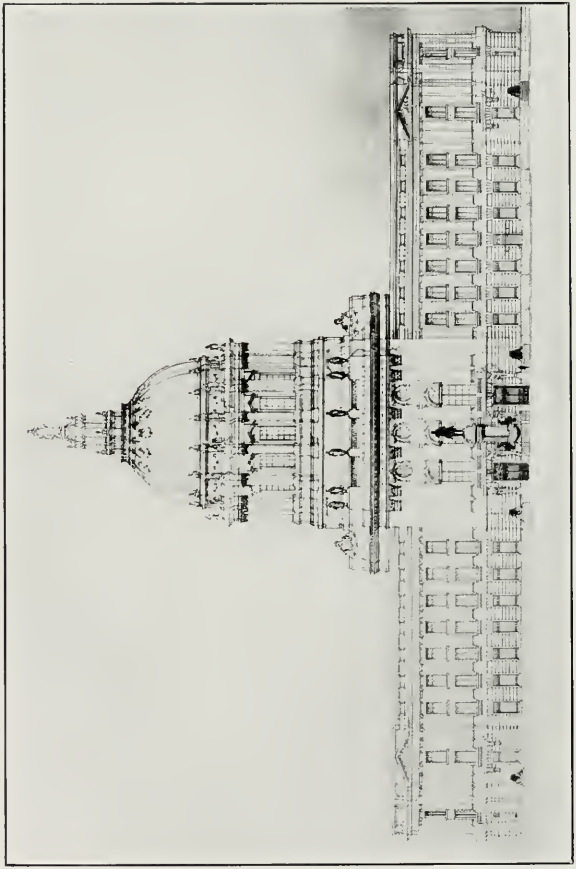
When this idea to be expressed is finally selected it can by study be made more and more lucid and apparent, so that it is evident to any one at first glance.

The study of the program comes first, then the unifying idea and then the study of the elements.

To the layman the only thing in a set of drawings that really catches the eye is the outward expression of the plan in the elevations. Here again the idea which grows out of the plan must dominate to such an extent as to give beauty and interest to the whole composition. Here, too, a study of the proportions of the various parts as units and their proper relation to each other

† In this competition there were twenty prizes of $1,000 each, besides the first award. The drawings of all the successful twenty are shown either in elevations, sections or floor plans.

* Senior member of the firm of Bakewell & Brown, awarded first prize in the competition.



West Elevation, San Francisco City Hall

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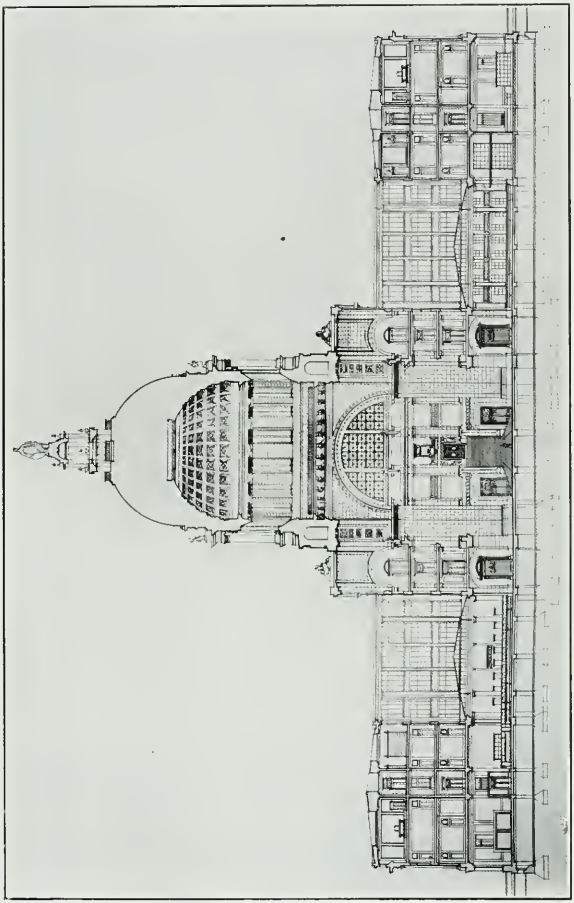
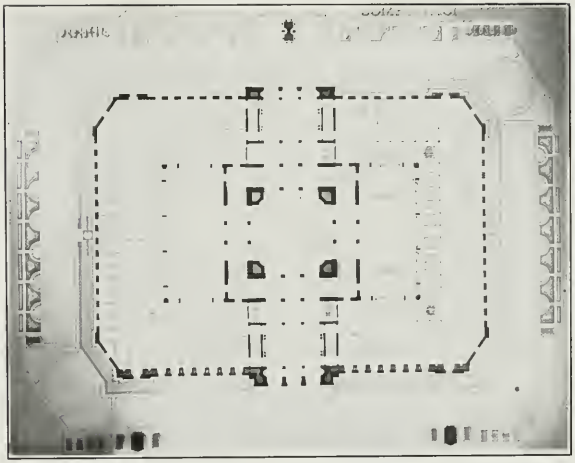
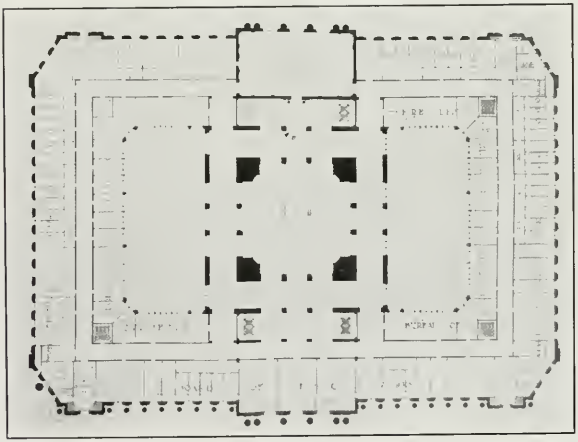


Section San Francisco City Hall *Bakewell & Brown, Architects*



Ground Floor Plan Bakewell & Brown, Architects



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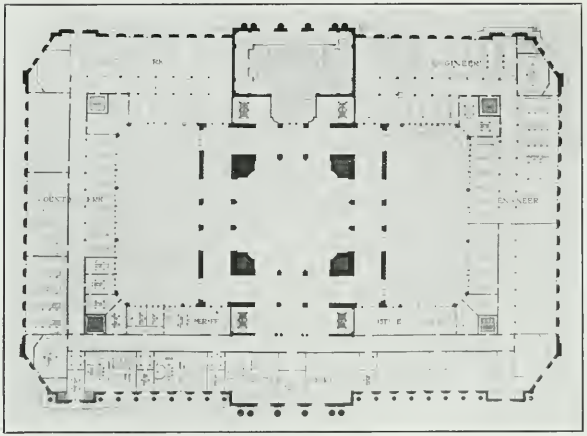

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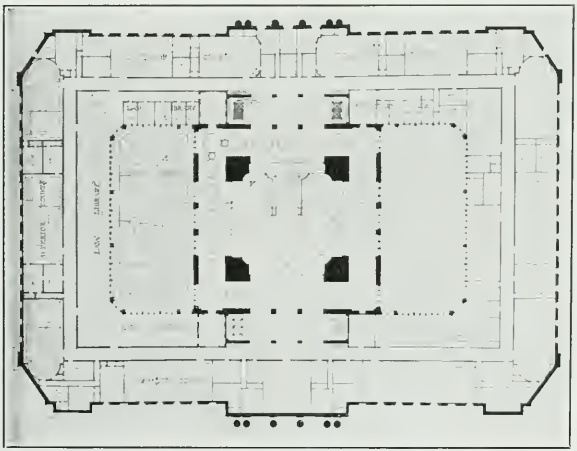

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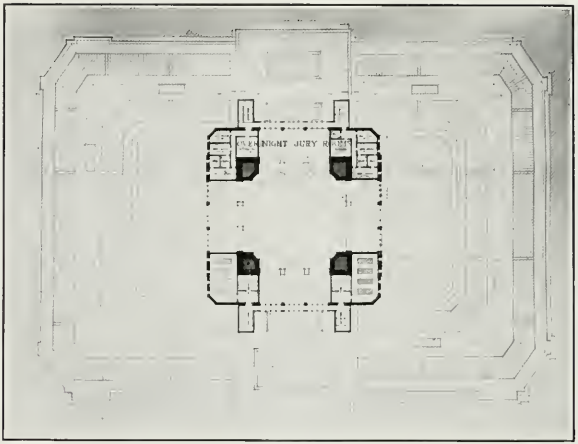


Roof Plan, Bakewell & Brown, Architects

will express the original idea more and more clearly until it at last is easily apparent.

Now, so far, we have merely tried to analyze the process of reasoning and composing that every competitor has gone through in arriving at his final result.

In the recent competition there were a great many different schemes or ideas—some of them very clearly and beautifully expressed. The first thing that struck one in looking at the different sets of drawings was the idea. Then a study of the plans would show whether the scheme was based upon a proper interpretation of the program. In other words the spectator takes just the opposite method of reasoning from the author. He sees the result and then gradually works backward to the original program.

We have been asked to give a description of the winning design for the City Hall, and the simplest way to do this is to first explain the process of evolution through which all designs must pass before completion.

The central feature was clearly indicated by the program, whether it be a dome or tower. And not only by the program of this building itself but by the larger program of the whole civic center. This group of buildings should be crowned by a dominating central feature, and the importance of the City Hall as well as of the buildings that will flank it seems to call for the noblest of all Architectural forms, the dome.

Then, too, the interior effect of a monumental dome running up through the various stories serves to unify the whole building.

On the ground floor this is made the center of circulation from which one passes directly into the large departments of the ground floor. These departments have been simplified to two immense spaces, the subdivisions being arranged just as those of a large banking establishment, or of a large corporation would be, by means of glass partitions and counters.

In this way the plan is simplified to the last degree, and the central feature becomes strongly emphasized.

On the upper floors the two side courts flank and light the dome, and the circulation divides itself into two continuous corridors tied together again by the central feature.

In the study of the exterior the two story order of the wings gives good scale and makes it possible to get a central dominating façade feature. Then in turn the dome dominates the whole.

The order is of such scale as to give a practical working unit of bays for subdivision into offices. At the same time it is not so large as to affect the lighting.

To sum up, the feature of the plan is an interior dome or rotunda forming a center of circulation, while the feature of a façade is a gradual building up of the Architectural interest from the smaller order of the wings to the larger central order and pediment, and finally, to the culminating dome. Both plan and façade emphasize and point to the dome, the crowning center of inteerst.

* * *

The San Francisco City Hall Competition

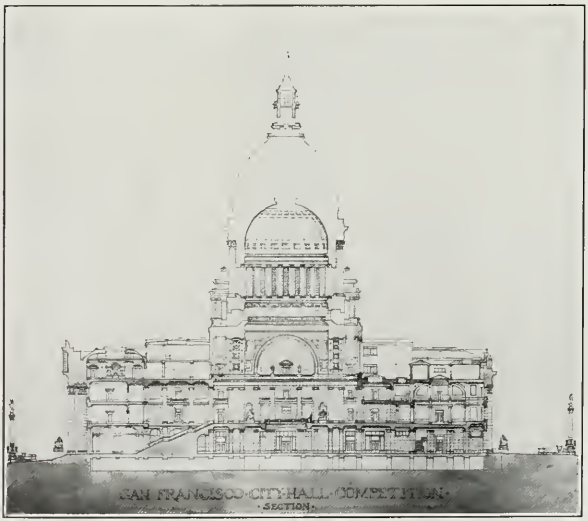
By B. J. S. CAHILL, Architect.

FROM the cash prize point of view the recent San Francisco City Hall Competition was the biggest ever held on the Coast. In the Phoebe Hearst Competition for the University of California, eleven firms received twelve hundred dollars apiece. The winner got ten thousand and an additional six thousand for revising his drawings. In the competition just held, twenty men are to receive a thousand dollars each and the winner nearly fifty thousand, assuming, as in the case of the University Competition, that the winning architects supply the preliminary plans only. In the event of the successful architects carrying the work through to completion, their recompense will be six per cent of the cost of the building. And the cost will not be less than four million dollars.

But whereas the University Competition was open to the whole world, including Japan—the San Francisco City Hall Competition excluded all the world—even Oakland. In the first competition, although the buildings were to go up in Berkeley, only three men from California competed. In the City Hall contest the plans judged were seventy-three. The writer has urged the benefit of confining competitions to one locality. But outside of the rather sordid notion of keeping the money at home not much advantage from an artistic standpoint really comes of local effort. The modern world knows nothing of intellectual or artistic isolation such as prevailed in olden times. With our designers all brought up in the same school, or taught by teachers from the same school, the aims and ideals of all of us are similar. In this broad land the universal tendency is towards a common standard, and the common standard is set by the few men who achieve the largest success. Books, photographs and periodicals spread the work of the current year equally before the eyes of the entire architectural craft. If there is any difference developed in different localities, it is not that New York and San Francisco are going different roads towards different architectural goals but that one merely lags behind the other in making for the same goal.

In reviewing the result of an important competition it is well to bear this in mind. Those of us who imagine that such an enticing appeal to the talent of a town would bring out local characteristics or new tendencies were woefully disappointed. There were not lacking schemes of originality, modernity and daring. Some designs were unhackneyed in treatment or unfamiliar in

East Elevation *John Baur, Architect*

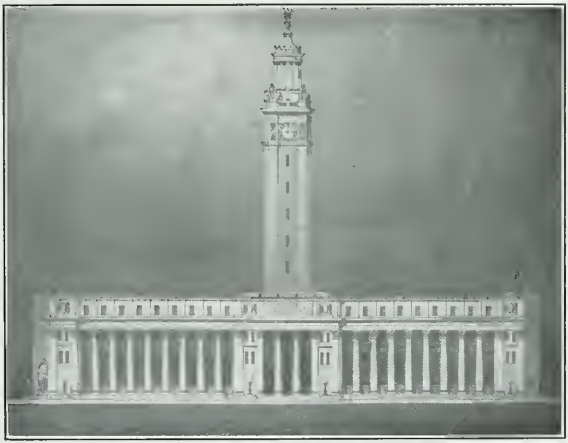


Section Plan *John Baur, Architect*

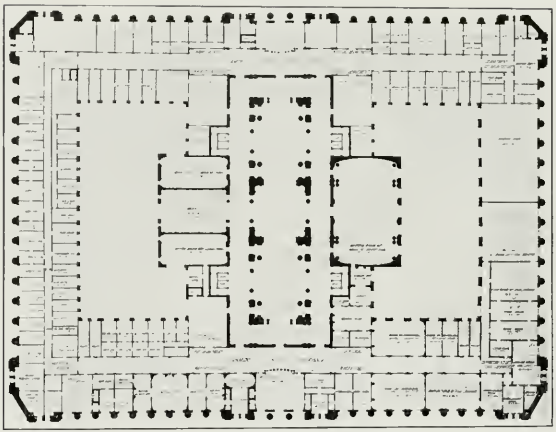
form. Some of the "*partis*" were departures. A few of these were encouraged, but not all. Surest encouragement and victory itself went to the perfectly obvious, the two-court plan, even the four-court plan and the inevitable dome—the dear old comfortable fat familiar dome! It may be that in this instance the safe conservative thing offered was so attractively served up that it won out over fresher offerings not so well served up. The new City Hall, as we all know, must be finished by 1915. For work to be done in a hurry, and municipal work at that, no doubt it is wise to choose the "regular thing." Even in modern work where time is not such an important element there are good arguments in favor of adopting some typical form or feature that has been done well, and done often rather than risk failure in attempted creations of our own. The leading architectural firm of the country has shown how successfully this can be done. The progressives in the profession who lament that the chosen design is a generation behind the times might take consolation in the fact, too, that public work must almost necessarily be behind the general line of march. It indicates the architectural status of the community *en masse*, rather than the standard of the cultivated few. A City Hall design should please the people rather than the profession. It should express the voters' idea of architecture rather than the ideas of the votaries of architecture. And perhaps after all this community judgment is the best of all judgments in the long run.

An Architectural Competition consists of a trinity of elements, all equally important, namely, the conditions, the competitors, and the critics. If the first and third are unsatisfactory there will be none of the second.

The programme for the City Hall was attractive in its remunerative aspect, although not without puzzling features in detail, and, worst of all, an indeter-

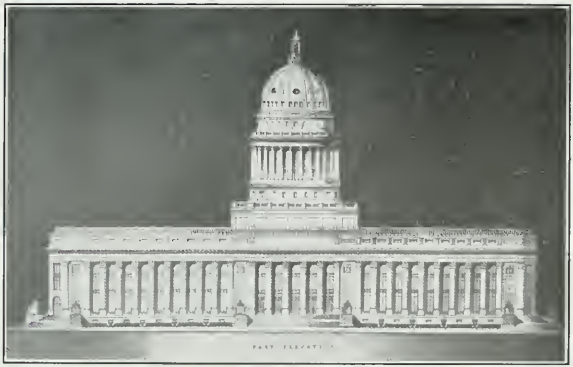


East Elevation *Charles Peter Weeks, Architect*

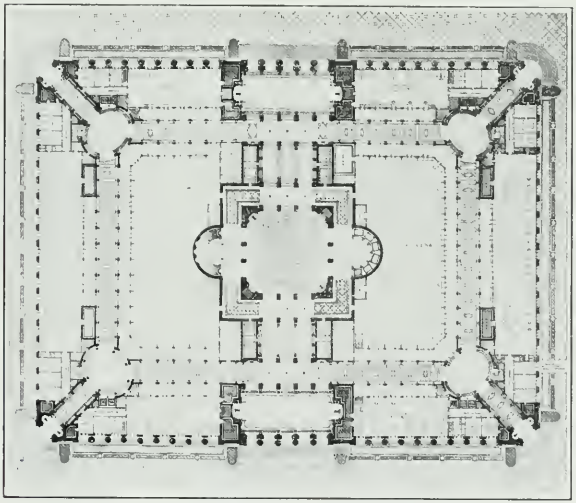


Floor Plan *Charles Peter Weeks, Architect*

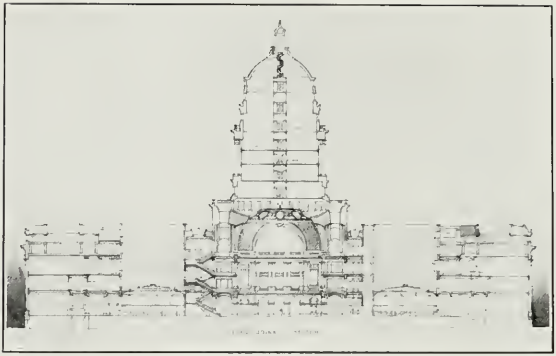
minate site. An old proverb has it that between two stools one falls to the ground. A building schemed to sit on two sites is in similar danger to a man on two seats. This was the case in Portland. The Auditorium Competition was programmed before the site was finally and fully determined. The need was generally expressed to have a completed building within a year. This is, comparatively speaking, about the same rate of speed needed for our City Hall. With the usual wasteful haste so typical of some of the unwise men of the West, the matter calling for deliberation was hurried, and the negotiations calling for speed were postponed. The result is that, although it is a year since the programme was issued and although plans were selected in desperate haste, the site is not settled yet nor the building begun. Portents are not wanting, to those who can read them, that a similar fate awaits us here in San Francisco. It is devoutly to be hoped that it is not so. But it would not be surprising if the whole Civic Center project were to come to naught and even the construction of the City Hall be indefinitely delayed. In the writer's opinion it was both immoral and injudicious to attempt to remove the City Hall from the old site. It savors of a trick. The administration was solemnly pledged to a new City Hall on the old site. Nothing is gained by the change architecturally. Meantime with a "draughtsman's" Civic Center scheme calling for more land than is needed or can be adequately paid for, a spirit of uneasiness and suspicion is gaining ground among the very property owners whose good will is most desired. No city improvement scheme will succeed or has a right to succeed which works any injury on even one citizen. The attempt to force citizens to release $5,000,000 worth of property for a payment of $4,000,000 is a rank injustice. Such an outrage, even if successful, will work harm to every city improvement scheme now under way throughout the whole country. Suppose the administration proposed to dock 20% from the



East Elevation *Righetti & Headman, Architects*

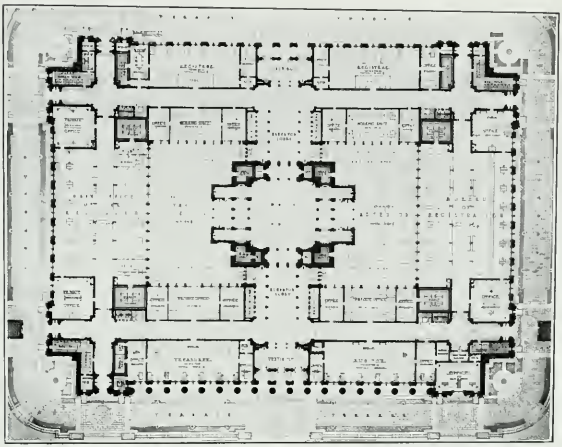


Ground Floor Plan *Righetti & Headman, Architects*



Section *Righetti & Headman, Architects*

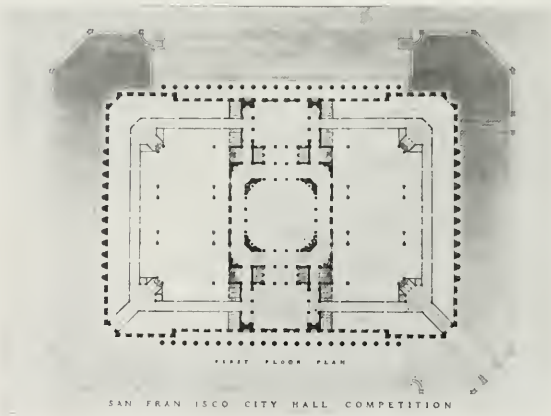
Elevation *L. B. Dutton & Co., Architects*



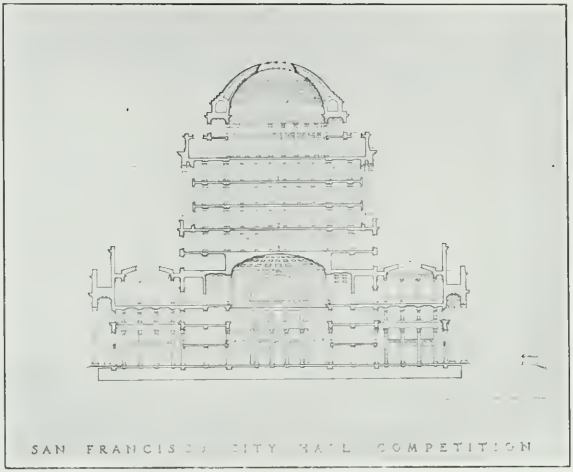
First Floor Plan *L. B. Dutton & Co., Architects*

Front Elevation *Oser Bros. Architects*

East Elevation *Bliss & Faville, Architects*



Ground Floor Plan *Bliss & Faville, Architects*



Section *Bliss & Faville, Architects*

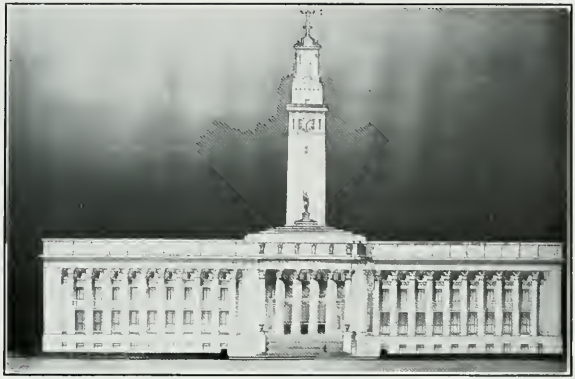
East Elevation *Wollett & Wollett, Architects*

price of materials and the labor going into the City Hall, would the howl going up be less audible if a judge should urge that the loss to working and material men was the price of their patriotism?

As a matter of fact, the new site created for the City Hall by cutting the original triangle up and adding part of a street to square up the balance was not necessary. But the mania for uniformity and formality—for straight streets and square buildings—seems to override every other consideration. One would welcome a curve, a bend, an angle or a little irregularity. We already have hundreds of miles of straight streets and hundreds of rectangular blocks. The old line parallel to Market street might have very well been retained. An approach could have been made to the City Hall by an oblique widening of McAllister street. We could well have spared so much squareness and straightness in the Civic Center plan had we a little more of those attributes in the way it is being carried through. The owners would appreciate a square deal in the matter of prices and the public generally would be better served by straight-forward announcement of the city's intentions at the start rather than by the tortuous method of trapping the public into one course of action after baiting it with promise of another.

A change of site, moreover, while it may have made no difference in the judgment of the plans, certainly does make a difference in the fitness of the building. For example, the Van Ness site does not require the dominating monumental feature to be in the center of the building mass at the intersection of two axes. Nor is there any need of clipping the corners of the block. Had these two restrictions been absent from the beginning the entire character of the competition would have been different. The announcement of the change before closing the competition was an extremely ill-advised procedure and in spite of all solemn announcements to the contrary it is perfectly clear that the change worked an injustice on some of the competitors. The more conscientious and ingenious the architect, the greater would be his handicap.

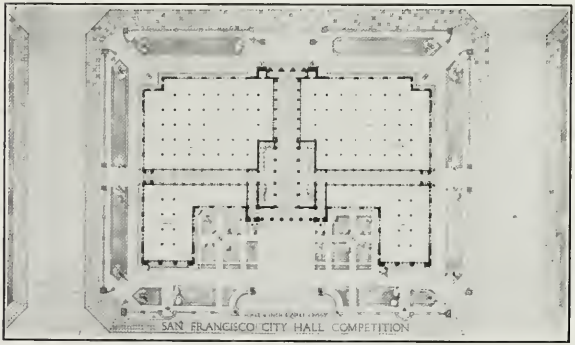
Let me explain: A designer in laying out the first dummy scheme on the most obvious layout—the four courts—would soon learn, that in accommodating the departments properly and allowing sufficiently for real circulation that there was not enough "cubage" left over for monumental circulation on a scale big enough to warrant a great dome. And his architectural instinct would warn him that the only dome that could rise from the center and dominate a building 300x400 feet must be a very big one. And a dome, besides being big, must be hollow. Right instinct would warn our architect against attempting to put any departments in a dome. He might also argue that a dome is a recognized feature of a State Capitol or County Seat, at least it seems to be generally so understood. For these reasons he would turn down the dome idea at the outset. The programme will not permit it, nor is it suitable for a City Hall. He would then turn to the tower as the monumental feature. A tower may with propriety be used to house certain overflow departments. But a tower arising from the middle of a rectangular ring of pavilions is again bad architecture. What is to be done? What is the answer? If our architect realizes that this is the crux of the problem, as he should, he will devote all his energies to finding it. From much hard thinking and a tryout of many *partis* will come some solutions about as follows: One idea will be to abandon the central monumental feature altogether. Another, not so clever, will treat it in a wholly subordinate way. A third consists in striving to bring the tower down to the ground by putting it in an open "cortile" of a "U" shaped scheme with a peristyle across the open end. Carrying logic still further a quite brilliant solution lies in the "I" plan which allows the tower to



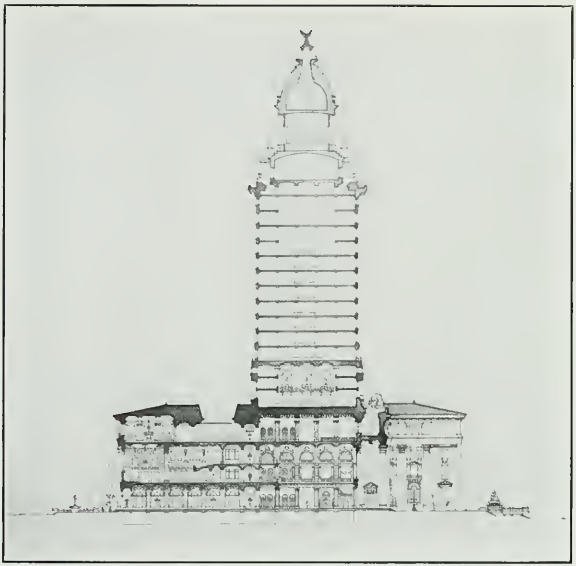
West Elevation *Wollett & Wollett, Architects*

East Elevation *Shea & Lofquist, Architects*

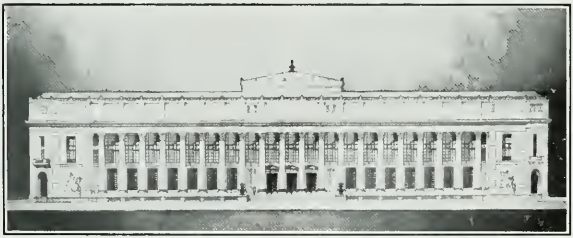
East Elevation *Ralph Warner Hart, Architect*

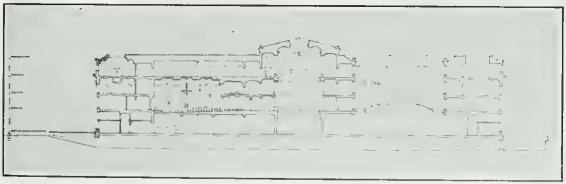


Ground Floor Plan *Ralph Warner Hart, Architect*

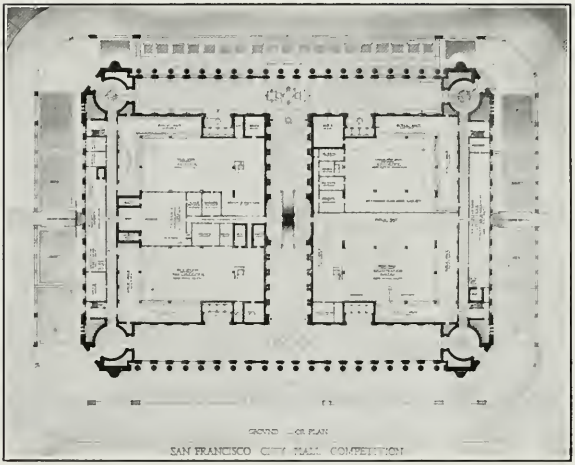


Transverse Section *Ralph Warner Hart, Architect*

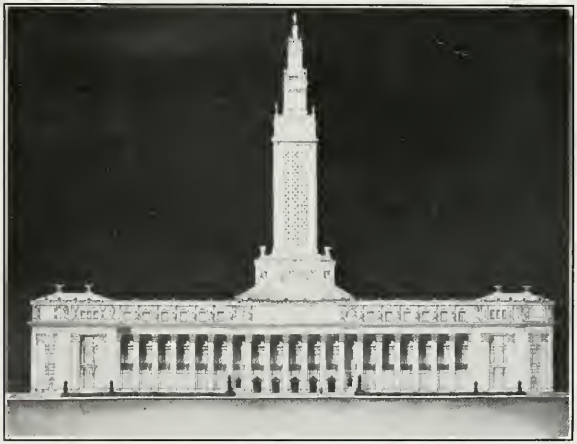




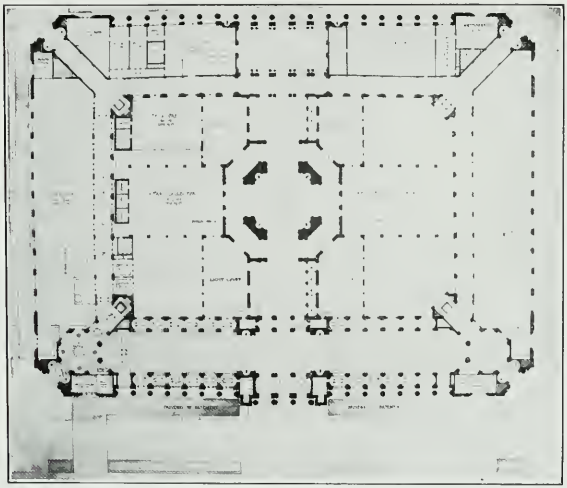
East Elevation and Section *Coates & Traver, Architects*



Ground Floor Plan *Coates & Traver, Architects*



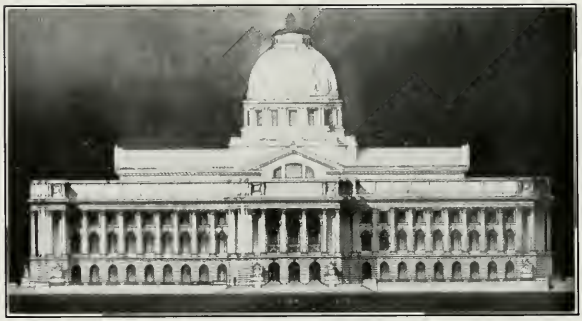
East Elevation *Edward T. Foulkes, Architect*



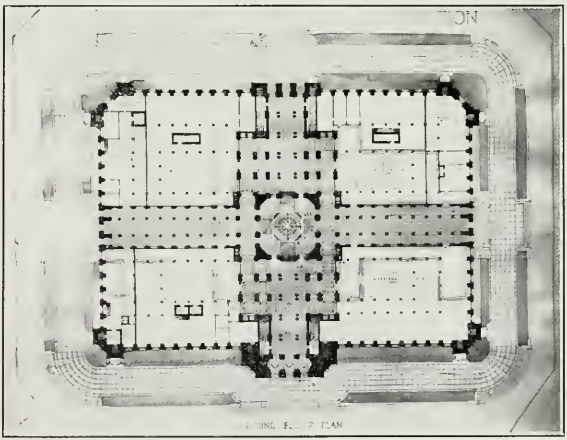
Ground Floor Plan *Edward T. Foulkes, Architect*

straddle the stem and touch ground on both East and West sides. If to this ground plan, the council chamber be added so that one-half becomes an "E" and if the three projecting pavilions be united with a peristyle on the supposed Civic Center side this would yield on the whole the most satisfactory solution. A high galleried nave ploughed lengthwise through the center of the stem would yield concentrated yet monumental circulation serving all departments at right angles to this nave or at each end of it. There would be no long corridors and no inner light courts and no need of wandering round and round in a ring or system of rings which in some of the plans submitted seems to have been mistaken for "circulation." Perhaps the word is to blame. "Circulation" unfortunately means anything *but* wandering around in a circle. If there must be such a condition it should occur in the monumental region and not along isolated, thin, dark passages.

Now, the architects who thought out their problem along these lines evidently wasted their time. They stood no nearer to winning than the men who designed thin, inadequate or illogical domes, or those who carried tall towers up and out of a clutter of tiles and skylights. So also did those conscientious designers waste time who took to heart too seriously the odd chamfering of the block's corners. The view from Marshall square naturally appeared of great importance to many. But since every one of the judges knew that the building would probably not go up on Marshall square at all—these efforts again acted as a handicap. The man who was not particular about these things stood as good a chance as the conscientious man who was particular about them.



East Elevation *Ward & Blohme, Architects*

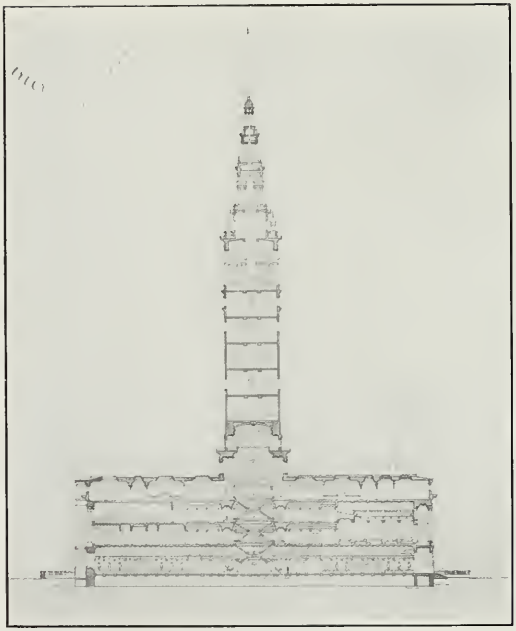


Ground Floor Plan *Ward & Blohme, Architects*

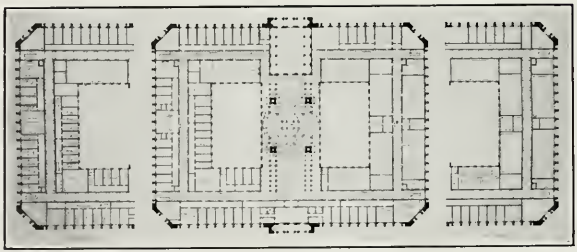
East Elevation *William Mooser, Architect*

There used to be a saying among builders when competition was keen that the only way to secure a contract was to overlook an item or make a mistake. And there seems a sort of truth in the remark made to the writer that the only way to win a competition is to ignore the programme. To put it another way, the man who religiously adheres to the programme has a small chance of winning. In fact, nowadays everything seems to be against the conscientious man. In business, sport, and politics, as well as in the professions, it is the same story.

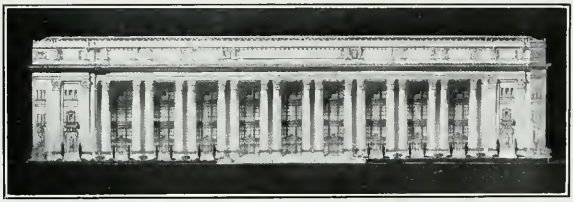
These remarks are made, not to cavil at the chosen design, but to draw attention to the fact that the winning architects had a conception that so obviously transcended the conception of the programme makers. A competition is interesting and fair in the proportion that the conditions are interpreted in the same spirit by everybody. There is something wrong with any programme which leads one able competitor to omit a central monumental feature altogether and another to allot a sixth of the entire floor to one. It certainly is worthy of note that this one central feature which is by far the biggest one thing in the winning design, the biggest thing in all the designs—that this huge

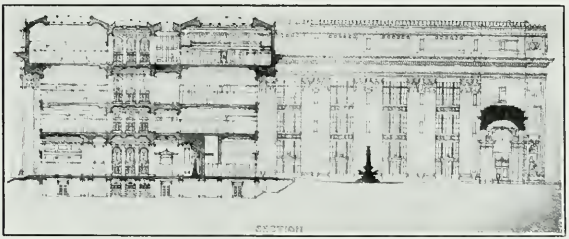


Cross Section *William Mooser, Architect*

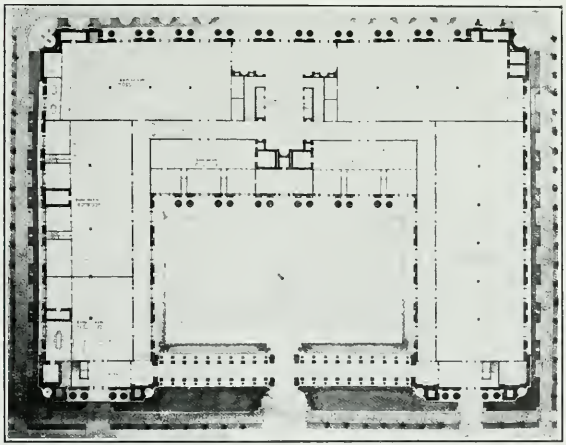


Second Floor Plan *William Mooser, Architect*

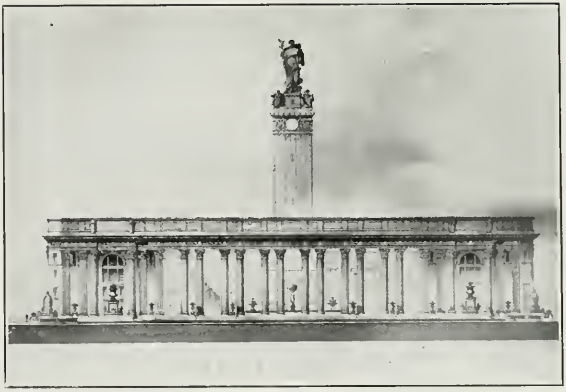




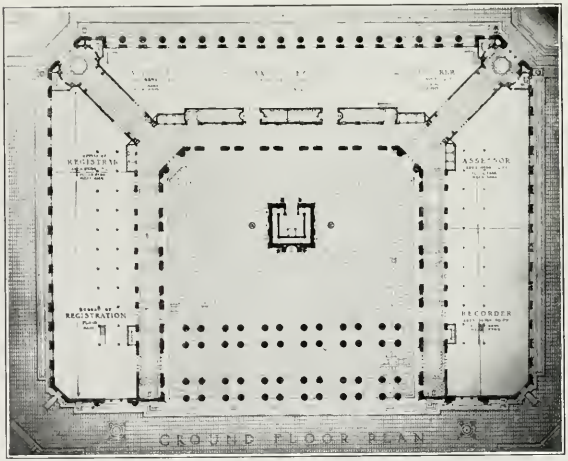
Elevation and Section *Milton Lichtenstein, Architect*



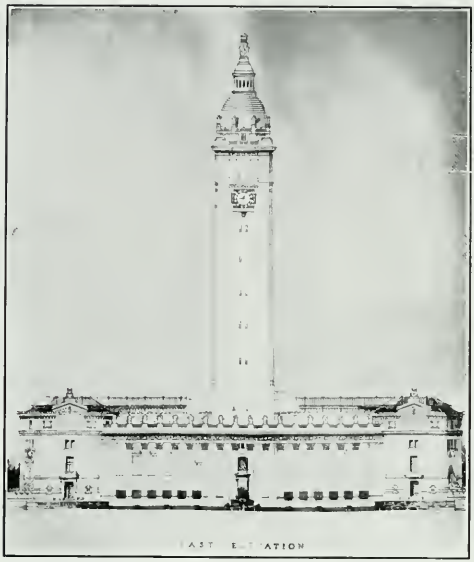
Ground Floor Plan *Milton Lichtenstein, Architect*



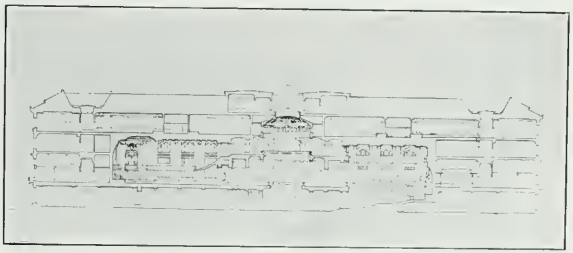
West Elevation *Louis P. Hobart, Architect*



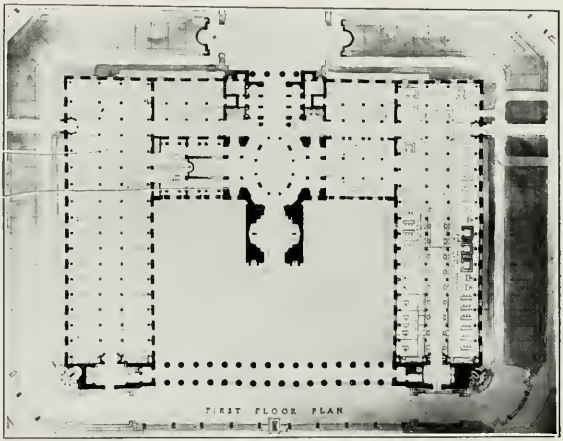
Ground Floor Plan *Louis P. Hobart, Architect*



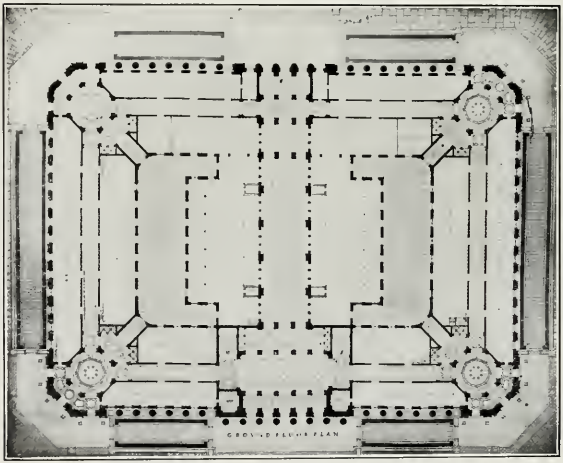
East Elevation *Wm. C. Hayes, Architect*



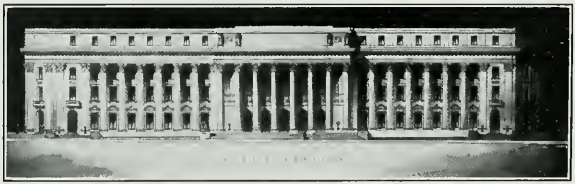
Section *Wm. C. Hayes, Architect*



Ground Floor Plan *Wm. C. Hayes, Architect*



Ground Floor Plan *O'Brien & Werner, Architects*



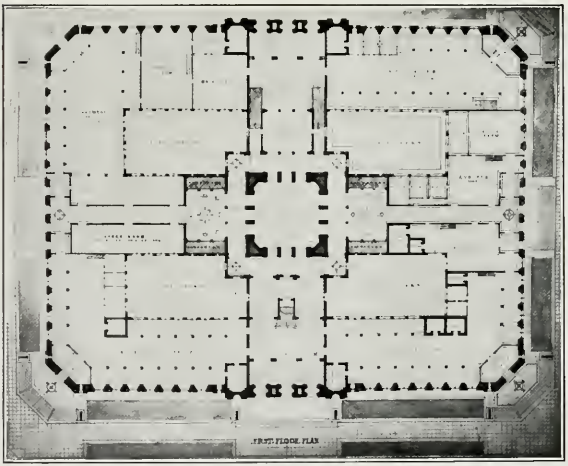
East Elevation *O'Brien & Werner, Architects*

dominant feature should be covered so casually in the programme which says that such a thing *may* be introduced! Why should this big feature be a matter of indifference at the outset, and of prime importance at the finish? In the words of Hashimura Togo—"We inquire to know."

A Word About The Winning Plans

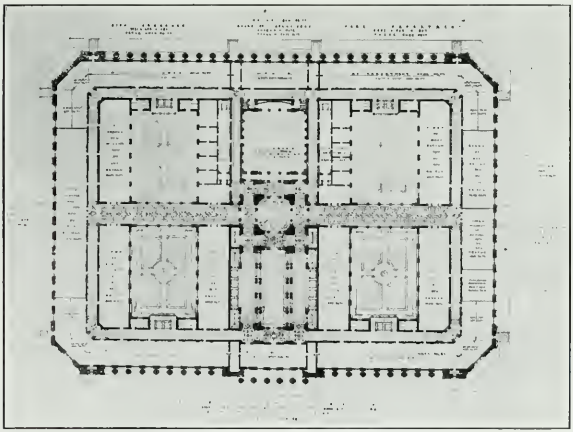
While one must be sorry for the mass of the competing architects who did their duty in sticking rather closely to a somewhat pinching programme, the winners are to be congratulated for their boldness and their nice sense of the psychological aspect of the competition. And this is no disparagement whatever of the architectural solution. They wisely chose the dome. They made it big and they made it hollow. The ample square gallery around it providing the monumental circulation is splendidly conceived. The straight-forward way that it becomes a part of the secondary circulation around each of the flanking courts on the second and fourth floors is managed in a larger, broader way than on any other plan. On the first and third floors this great square leads directly to the larger departments in a free, clean cut manner that is altogether masterly. The great fault most generally felt with most of the drawings was in the planning. Most of the competitors seemed to have been too soon satisfied; to have spent much too little time on small scale sketches and full scale studies. The plans of Bakewell & Brown give all evidence of complete and exhaustive study. Particularly fascinating is the first story. It was the cleverest bit of plan making, pictorially, practically and departmentally, of all the plans recently on exhibition. To begin with, this floor was the most difficult to lay out of all the floors. Of all the human faculties the synthetic is perhaps the greatest—the power to generalize. This plan shows a really brilliant bit of generalization which, simple as it may look, is after all a stroke of genius. The big sweep of cross circulation from the front to the rear (the only public entrances) is of course a very good arrangement. It left the big departments in the largest groups and provided the necessary proximity between offices that are functionally allied. The stroke of genius was in putting the Auditor, Assessor, Tax Collector and Treasurer together in the South half under the general title of "Finance Group." The other half housed what might be called the documentary departments—where voting citizens and their deeds are on file and on record. The "pochet" of this plan is well worth study. The dome and its connection with the central large order pavilions is well expressed on this plan. It is one of the vital features of the whole design. Just as interesting is the clever arrangement of counters, furniture, vaults and stairs to make clear the secondary circulation. Other devices to "grey" the plan in the needed areas and to bring out the boundaries of the building are all worth study. The

Elevation *Geo. W. Kelham, Architect*



First Floor Plan *Miller & Colmesnil, Architects*

Elevation *Houghton Sawyer, Architect*



Ground Floor Plan *Houghton Sawyer, Architect*

simplicity and symmetry of the whole plan, moreover, is not artificial, as one might at first suppose.

One might criticise the position of the main central stairway. A great vaulting dome will cause visitors to look up, and these hard marble steps suggest unpleasant consequences.

A glance at the cross section will show the bigness of the central dome. The scale of the four great piers, it will be noted, is actually bigger than anything on the exterior façade. The section will also show that this central feature is paid for by the rather crushed looking courtrooms on the fourth floor. A court room needs height for very real and practical reasons because height gives dignity. And to uphold the dignity of the law is really more important than to have fine buildings. The fourth floor plan likewise reveals corridors that appear inadequate. The overflow of a group of busy courtrooms demands much ampler circulation. The corridor outside a courtroom is a veritable "*salle des pas perdus*" and should be treated as such. This can be effected when the courtrooms are made higher by putting the jury rooms on a mezzanine, and throwing the "floorage" thus saved into the hallway.

The exterior design is in very fine proportion and perfect silhouette. At least so it appears when done in two dimensions. A plaster model will probably call for a still more stilted dome—if it still remains in the center. As an example of the fickleness of fashion in building as in dress, it will be noted that "the big column" did not win. Neither did the long colonnade. Whether this indicates a reaction or whether the smaller interrupted order was dictated by the needs of the composition is a difficult matter to determine. Personally, I incline to the latter view. Either the big column or the big dome must dominate. In this case I seem to feel that the dome is the important thing, and that its vertical expression was a paramount need. Furthermore, it was necessary to bring the base of the dome at one with the central façade East and West, as indicated on plan. To further emphasize the fact that the dome is one with the masonry of the front pedimented pavilion the order is enlarged and the pavilion stilted. While the eye cannot see the junction of the dome with the front pavilion it leads one easily to feel and realize it in noting the return wall of this central high pavilion, as it disappears over the parapet of the smaller wings running North and South.

The sincere and architectural handling of this whole design as a clean cut strong expression of the plan is highly commendable and in striking contrast to the very pictorial and papery presentations of some of the other competitors.

The actual drawing of these plans put them in a class by themselves. One felt the large amount of study and pains put into countless "calques." The actual rendering had the lightness and daintiness of the etcher's needle.

It is to be hoped that the successful architects will have full charge of the work and carry the building through to completion by 1915.

* * *

Nothing to Do Till Tomorrow

"Ain't you workin' tod'y, Bill?" inquired a cockney as he encountered an acquaintance lolling by the roadside.

"No, Hi've a d'y all to me self."

"'Ow is that?" asked his curious friend.

"Well, you see, it is this w'y. Hi worked in a domino factory a-puttin' of the spots on the bloomin' little boards, and tod'y they are a-makin' all double blanks, so Hi 'ave a d'y off."

Missouri State Capitol Competition Program

AS A RESULT of conferences between representatives of the American Institute of Architects and the Missouri State Capitol Commission an amended program of competition for the proposed Capitol building has been issued that satisfactorily disposes of the points in the original program to which objection was made. At a meeting of the Board of Directors, held in New York City, the present program was approved.

It is gratifying to know that those charged with this important matter were able to devise a plan of competition that meets the requirements of the law creating the Capitol Commission and at the same time provides for conditions of practice which should bring to the solution of this problem the interest and skill of all architects qualified to execute a work of such importance.

The usual methods of a preliminary and final competition will be observed. The preliminary is open to practically all architects desiring to compete. As a result of this preliminary test, ten competitors will be selected to enter the final competition. The jury of selection will be composed of three architects and the Board. The final competition will then be held, the prize winning competitor being awarded the commission, while the remaining nine will each receive one thousand dollars. The usual 6 per cent. fee will be paid to the successful competitor.

Copies of the amended program may be had by application to E. W. Stephens, chairman of the Capitol Commission, Jefferson City, Mo. The competition will be concluded September 10th.

The result of the controversy over this program will doubtless be regarded with satisfaction by every member of the profession, and the action of the institute in conserving the interests of architects will meet with general approval. The discussion has served to better inform municipal and state authorities as to the ethics governing the practice of architecture in this country and will establish a precedent that will have a far-reaching influence in future important competitions.

It may be announced as a truism that there are few questions at issue that cannot be satisfactorily adjusted when the motives of both sides are only those prompted by an earnest desire to conserve legitimate interests, be they public or private.

* * *

Mr. Taylor's Successor

Oscar Wenderoth, of the firm of Carrere & Hastings, of New York, has been selected by Secretary MacVeagh as Supervising Architect of the Treasury Department, to succeed James Knox Taylor, resigned. Mr. Wenderoth was associated with Elliott Woods, superintendent of the capitol, in the construction of the Senate and House office buildings. He was connected with the Supervising Architect's office for six years.

Mr. Wenderoth was formerly associated with the office of Mr. Albert Kelsey, now of Kelsey & Creb, Philadelphia. He won his first laurels some eight years ago, when under a civil service examination authorized by the Tarsney Act, he passed, in a competition with two hundred college men, with the highest honors. A result of this test was Mr. Wenderoth's appointment to be senior draughtsman in the office of the Supervising Architect. Carrere & Hastings, as architects for the Senate and House buildings, selected Mr. Wenderoth as superintendent, a position in which he jointly represented Carrere & Hastings and the Government.

The Historic Precedent in Coast Architecture

CHARLES H. ALDEN, A. I. A.*

THE section of our country commonly known as the Pacific Coast has general characteristics common to the other portions of the United States but differs in some significant respects, and this difference, is particularly marked as it relates to its architectural development. Its commercial and business activities, not unlike other portions of the country call for adequate housing; the home life of the people, the private and public demands inseparable with the true expression of the American life of today require attention from the builder as they do elsewhere. This coast is peculiarly situated for meeting these requirements and particularly in the manner in which they should be met by the architect.

The problem is a different one partly on account of our great extent of territory demanding at different points varying architectural solutions, but it differs particularly in that it is a new country—new in not having its civic, domestic and other features developed by a slow process of evolution. In comparison with older communities our cities and towns spring suddenly into existence. San Francisco grows from a gold mining camp in '49 to one of the leading cities of the world in population, civic enterprise and beauty in the short space of fifty years, is destroyed by fire, in five short years it has risen again to more than its former commanding position. Los Angeles in a lesser period of time develops from a little settlement of adobe houses to a city not far behind San Francisco in population and built up with substantial business buildings. Seattle in 1870 consisted of a few frame houses clustered around a saw mill; it now has more than a quarter of a million inhabitants housed in buildings in keeping with the life of a great city.

The situation before the Pacific Coast architect is in consequence radically different from that in the Eastern states of more gradual development and with a continuance of the influences that have carried our traditions down from the unbroken sequence of the past. It is this problem that gives us unusual responsibilities and attracts the attention of our profession elsewhere in the common desire to express adequately the conditions to be met in our architecture.

It was partly for this reason that the recent convention of the American Institute of Architects in San Francisco was so notable an event in the annals of the profession. Notable in showing to our Eastern brethren how we had built cities in a fraction of the time in which they had evolved them; notable to us in that under such favorable auspices we could obtain the point of view and criticism of our fellow workers in a different environment. The comment expressed by these visitors was singularly alike and worthy of our attention. We were congratulated on having so quickly and adequately provided for the needs of our civic life. We were congratulated still more on the splendid opportunity that the practitioners on the Atlantic Coast felt they did not have for developing an architecture unhampered by the persistent confusion of so-called styles. It was felt that thus far we had not taken full advantage of this opportunity. As one speaker expressed it, referring to the conventional work he had seen in San Francisco. "We expect that and more."

If this comment is just we should endeavor to realize our position and see how it can work to our advantage. Let us note first to what extent architecture, and particularly American architecture, should be influenced by these historic styles. This is not a new question, it is a favorite theme for the

*Paper read before the second annual convention of the Architectural League of the Pacific Coast.

student of architecture but it is particularly applicable to us on the Pacific Coast at this time.

It is theoretically right that architectural expression should be a logical development of traditional style when that style can be adapted to its new conditions and made thoroughly alive to the characteristics of the people, climate and natural surroundings. This has been the history of the successful sequence of architectural styles from the earliest days. Reviewing this history we find the habitations of primitive man a necessarily crude expression as his civilization was crude. This developed to a higher type as civilization developed until in the classic architecture of the Greeks and Romans we have an inspiration to our later architecture as their arts and letters were an inspiration to the later art and literature. When the Romans became assimilated with the barbarian nations, their architecture changed to meet the new influences, passing through the Romanesque and Gothic to the Renaissance. This Renaissance, a re-birth in architecture, letters and religion pervaded the whole civilized world and found varied expression in the different characteristics, climate and natural surroundings of the various countries. It was this Renaissance that was in vogue when this new world of ours was first colonized.

The conditions affecting architectural development in this new country since its colonization were unfortunately different from those fostering the logical development of the historic styles in the civilizations of the past. It is true that our Eastern Coast was peopled during the period of the Renaissance architecture and that the prevalent Georgian type of English Renaissance found expression in the tasteful Colonial so prevalent in the older Eastern coast cities. It was not long, however, before this natural development was upset by radically different and changing ideas as to what style our buildings ought to be. There was one period when it was thought a style must be arbitrarily assigned to each type of building. A church must be Gothic, a warehouse Romanesque, and a theater Renaissance. Then our academic enthusiast would have us interpret everything in the strict language of the Paris school. Again a certain kind of architecture was made fashionable by popular accord. Practically every known style was forced upon us in some manner at different times. This occasionally drove the individualist to extremes and he would reject all precedent and build according to his fancy. It is from these unfortunate conditions that our Eastern cities wished for relief and congratulated us on what they believed to be a better opportunity to work out some style fitted to its environment.

What the Western coast really offers is for us to determine. The architect from the East fails to realize the extent of our territory and its varying conditions. If he should undertake to design for us he would probably think our building must be "Mission," as that is the one characteristic style of the Pacific Coast. He is not cognizant of the fact that our coast is fifteen hundred miles in extent with large areas of adjacent inland country and that the climate and natural conditions vary as they do between corresponding latitudes on the Atlantic. How to design a building for the shores of Puget Sound is quite a different problem from meeting the needs of tropical California and there is no merit in forcing a style contrary to the demands of its environment.

Since historic precedent is so vital a factor let us consider what the Pacific Coast has had to offer. While the Colonial was giving a fit expression to the architecture of the Atlantic Coast colonies, the territory on the Pacific was an unsettled wilderness. The early explorers in quest of gold or adventure left no colonies. If the English navigators who visited the California

shores in the sixteenth century had left a colony of their countrymen or a similar impress on the shores to the North, the result would have been far different. As it was in this great extent of territory Spanish missionaries alone left an architectural influence in this new wilderness. They made use of the traditions existing in the country from whence they came and left us a characteristic style necessarily crude but interesting as a logical architectural adaptation. This Mission style was already well established when Vancouver entered the hitherto undiscovered waters of Puget Sound, and it was many years thereafter before any settlers found a foothold on this Northwest shore.

The California mission is the only historic style indigenous to the Pacific Coast country and this is confined to the South. The missions while not having the architectural importance of the Colonial buildings have perhaps more significance in illustrating the adaptation of historic types to new conditions. Their builders were far removed from the source of their inspiration and were at work in a wilderness where they were out of contact with any civilizing influence except such as they introduced themselves. They had a type of religious zeal not unlike that of the mediaeval architects who produced for us the religious monuments of the Middle Ages. Men of singleness of purpose without worldly ambition, they gave little thought to the non-religious phases of Colonial life. It was to their churches alone that they directed their attention in supplying everything possible to enhance their value in art, architecture and decoration. Their living quarters were plain and bare, expressing the life of their occupants. In spite of the simplicity of design and the difficulties encountered their architecture shows sincerity of purpose and reflects pleasing characteristic features of the Italian and Spanish Renaissance—simple wall surfaces with the play of light and shade and the perspective effect of cloister arches. These are difficult for us to interpret in modern construction but their aesthetic character can successfully influence our work if we do not attempt to copy too rigidly.

The architecture of the Northwest Coast, lacking as it does the direct influence of any traditional style, is compelled to seek a wider field for its inspiration. There is one, and one only, historic example in this Northwest territory akin to the Colonial of the Atlantic Coast, transmitted to us in much the same manner and not ill suited to its location in the primeval forest. This is the building of the territorial University of Washington, built in 1861, its date emphasizing the newness of our history. A native Northwest historian thus described it: "It was an imposing structure, sitting proudly upon one of Seattle's hills, where it continued one of the city's chief architectural glories for more than thirty years. Artists and experts always praised the structure as a remarkably proportioned, clean cut example of the Grecian style." The builder, like the builder of some of the best examples of Eastern Colonial, was an humble carpenter. This was his only masterpiece and unfortunately the only example of its kind in the West.

The building of the native and the pioneer providing so little of architectural interest we may next look to those neighboring countries with which our Pacific Northwest is associated. Alaska to the north and the Orient across the seas at once suggest themselves. Alaska is a land of the future. Its present is the civilization of the frontier. Its past is in the hands of the savage Indians with the slight impress of the Russian domination. The Alaska Indian was probably the most prolific artist of his race and in his interpretation of the lineage of his fathers in the totem pole he has given us an enthographic curiosity but not an architectural precedent. Russia never exerted any real influence on architectural style. The familiar Greek church

built by the Russians of Sitka is a landmark of Alaska. It gives color and interest to the country as does the totem pole, but it can have no influence on our architecture. Looking towards the Orient, Japan has special claims to our attention in its architecture as in other phases of its wonderful civilization. In seeking to assimilate it as with any other expression of its life we are met with its antagonism of ideals and methods. The Oriental life is communal; ours is individual. We do well to admire and get inspiration from the beautiful examples of the Japanese art, but our temperamental differences stand in the way of direct application. The architecture of China and Japan undoubtedly had a common origin with other old world styles, but it has developed by itself and now in its declining years is being abandoned to give place to the architecture of the Western world with other phases of our Western civilization.

Since history has done so little to aid or confuse us in our architectural design it is clearly the part of wisdom to study for ourselves the characteristics of our people, climate and natural surroundings to see how they affect, logically their architectural expression. Then with our own conditions clearly in mind see what is available for use in the varying requirements of the Pacific Coast communities.

California has well adapted the inspiration of her mission in domestic work, in churches, and to some extent in semi-public buildings. The architect of California should not be content with the crude material furnished by the mission builder but should revert again to his source of inspiration, the Renaissance of Italy and Spain, with its wealth of material worthy of our study and application as devotedly as it was applied by our Spanish predecessors. As we journey to the North we find a new climate, new characteristics of life, new surroundings. Obviously these must meet with a different expression, and we can find more fitting examples to guide us in the more northern countries of Europe, whose climatic conditions and resulting differences in life of the people are more in harmony.

England, Northern France and parts of Germany have a similar geographic position to our Northwest country. They all have a similarity of climate and have much in their architecture that we could successfully apply. England, our mother country, has transmitted to us much that has given us precedent in political and social life; its architecture is a fruitful field of study that has not thus far adequately received our attention. The timber and plaster buildings that so well express the domestic life of England and fit its natural surroundings, if thoroughly studied and intelligently adapted, would give an equal charm to our Northwest shores, where climate and topography are much the same as in the mother country. Our attempts at this half timber work show our neglect, so lacking are they in the spirit of the original. So with the Renaissance in our more pretentious buildings, whether it be the English Georgian or other phases of the northern quality, if devotedly studied and studiously applied it should give us a language to express the character of the North Pacific Coast.

What we need, then, is to attain our precedent from a careful and thorough study of the architecture successfully expressing in the past the characteristics of the people, climate and natural surroundings akin to our own, then with due regard to the true principles of the design, whether impressed upon us by the training of the academic school or not, express ourselves in the rich vocabulary applied in every detail to the requirements of our peculiar life. Will not this give us the true benefit of historic precedent without the confusion brought about by a multiplicity of styles which has been found to hinder our true architectural development?

Bungling the Bungalow—An Eastern Criticism

THE bungalow appears to be the purple cow of architecture. Very few New York architects seem to have built one, and they would all rather see than build one.

"I don't know what I should do if I were asked to build a bungalow," a New York architect said to the Sun reporter, "but I now have no very definite idea of what such a building is. I know that the word comes from India and means a small house, usually with a thatched or tiled roof. But the original significance of the word is slight nowadays for us. I at one time supposed that a bungalow had only one story, but I soon saw pictures of them with two stories. I supposed it was a low building stretching over the earth, but I later saw bungalows that looked like a Swiss chalet. Then I supposed they were made of wood, but I now hear that they are as a matter of fact built in all materials, from stone to brick. In fact, many of the so-called bungalows that I have seen seem to be, at the remotest, first cousins to an ordinary cottage. Perhaps a one-story cottage with its dominating dimensions, length and breadth rather than height, is what a bungalow has come to mean." Continuing the Sun says:

There are much more definite descriptions, however, of a bungalow than this architect admitted. Probably the fact that the bungalow was first built in the West, and in Southern California has been produced in its best estate, has led Eastern architects to be a little snobbish about it. They like to remain ignorant of something which, if not created, was at least brought to its highest expression of architectural style by their colleagues in the West. One definition of a bungalow that comes from this quarter is that the difference between the inside and outside of such a house must be reduced to a minimum. It will be seen, however, that this description applies more properly to bungalows built in a climate very different from our own.

As a matter of fact, the bungalow seems to be any kind of small, inexpensive villa, most frequently of wood, in which the architect makes a deliberate attempt at picturesqueness rather than rigidity of outline that used to be characteristic of inexpensive houses.

Undoubtedly the houses built in India and other tropical countries for the use of foreigners who went there and built these modest structures to house them during their temporary stay were prototypes of our suburban villa today that we call by the same name. Our bungalows since they migrated eastward from California have acquired characteristics which the houses they are modeled on could never have possessed. It was all very well for the builders of California bungalows to keep in mind the characteristics of these habitations, as they were built for warm climates. The plentiful supply of shade, the necessary arrangement for the abundance of air and the imperative cheapness in construction could well be kept in mind. Apartments large but few in number, many doors and windows, the rather casual arrangement of all domestic details were almost as appropriate to the California home as they were to those put up in India, but they would never do in New York or any of the regions in which the bungalow is regarded as anything more than a home for hot weather.

The California bungalows, the pictures show, are strong in the suggestion of Japanese origin. That characteristic scarcely exists at all in the bungalows built on Long Island or anywhere about New York unless it is found in the height of the buildings and the lines of their predominating dimension. It might, of course, be easy to say that if the bungalow requires

adaptation to our needs it is necessarily out of place in such a climate. There never was a time, however, when any convenience in architecture was willingly abandoned by people because it was not artistically appropriate. That the bungalow has come to stay as a popular form of summer residence nobody doubts. It seems just as certain that it will be used for winter residence also to the same degree that it is in California.

The great advantage of the bungalow is its cheapness and the certain element of picturesqueness that most of them possess. While it is of no importance in our climate except in summer months that a bungalow should impart to its occupants the feeling that they are living out of doors, there is an undeniable lack of formality about residence in this form of house. While a brick bungalow would not seem to purists in style a very congruous structure, yet it would have an element of novelty and interest that a brick cottage probably costing not more than the bungalow did could never possess.

Then the bungalow is just as unpretentious as the cottage, although it is much more tasteful and indicates more cultivation in its occupant than a cottage ever would. It seems to be an element of every bungalow that it should never count very strongly on the landscape. In California these houses with their long low roofs and their deep piazzas seem to cling to the earth. They are as much a part of it in nearly every case as they are of the trees which surround them. Such effects are, of course, more strongly supplied when the material of the bungalow is native. Since native woods are chiefly used for building the California bungalows, they have this element of artistic merit over those of the East, in which all kinds of materials are used.

It is undoubtedly true that the bungalow type has not yet reached the consideration it deserves and the commission for designing these buildings is so slight that architects of established position in the East do not care to trouble themselves about them. Some of the pictures show, however, how successfully these houses have been adapted to their sites, even in this neighborhood. They have proved to be a very appropriate crown for a seaside bluff, or they cluster gracefully on the top of a small hill. In such sites it is only necessary that the general lines of the bungalow type should be followed. Of course, a wooden bungalow seems much more appropriate for this region, just as brick might be regarded as the proper material for similar use in Pennsylvania and parts of Maryland.

But the bungalow is an imported style from which only the essential features can be drawn to suit actual American needs. So it is doubtful if the purist can find any grounds for criticism when details are left to the skill of the architect or the taste of the client. It is quite conceivable that a rough stone bungalow might fill the needs of this climate so long as it kept to the main suggestions that the bungalow has imported to American architecture. In these California houses it is customary to cover the walls and sometimes the roof with flowering roses or other plants suitable to the purpose, in order to make them seem as much as possible a feature of the atmosphere. It is inconceivable that a bungalow for this reason should require such treatment.

The bungalow therefore has come to mean for dwellers in this section of the United States the unpretentious substitute for the cottage. It is not expensive enough to reveal any very fine architectural treatment, but it can be made charmingly appropriate to its surroundings. It is convenient. In the majority of cases there are few steps to climb, and the arrangement of its rooms generally possess a compactness and conveniences, combined with a certain degree of formality that older houses never possess.

Use of Brick in American Architecture

CONSIDERED from the point of view of beauty, brick would seem to occupy a unique position among the structural materials available for the creation of beautiful buildings. Further analysis discloses, among others, the following interesting points:

Brick is made in reasonably small units, so that in the case of many modern buildings, at least one hundred thousand of them show on the exterior. This, together with the varying shapes and sizes now obtainable, make possible an almost infinite variety of form and pattern, thus giving full scope to the imagination, ingenuity and skill both of the designer and of the workman.

Brick, moreover, is now made in almost every conceivable color and shade the permanency of which is unequaled by hardly any other building material; with such a "palette," therefore, at one's command, and by a skillful use of color, the brickbuilder of today can readily add to his design that living touch which the painter gives us in his painting.

Brick may also be counted unique in the fact that it requires for its structural efficiency the use of a very considerable amount of material of quite another kind and color, namely, mortar, and further that this material must of necessity show in the form of a joint to a more or less degree in the face of the finished wall. A mistaken idea has prevailed that the mortar joint is a blemish that should be suppressed as far as possible, or be colored to match the brick. We find, however, that the designer of today seizes the very opportunity afforded by a mortar joint to introduce into his wall another element of color and pattern.

The word "texture" has lately come into use in connection with brickwork, and, strange as it may seem, this word has a very plausible application; for the builder of interesting brickwork has much in common with the weaver at the loom as far as resulting color effect goes. Just as the weaver, with his threads of varying sizes and colors, produces a never-ending variety of useful and beautiful fabrics, just so it is possible for the brick-builder, with his bricks and joints of many colors and sizes, to weave new ideas and combinations into his work, all in beautiful and imperishable patterns; and this applies to all brick.

Just as the fabric charms and delights the eye and at the same time protects man from heat and cold, and performs a thousand other useful functions, so the beautiful wall of brick, exemplifying man's ingenuity and his artistic skill, forms also the protective structure of the buildings erected for his use. Brick, therefore, would seem to fulfill to a very high degree the requirements of an ideal architectural material.—"Donn Barber."

* * *

Waterproofing Concrete Floors

CONCRETE floors should never be treated or dressed until they are thoroughly dry and well seasoned, and the dressing should be applied before they have been subjected to traffic or wear. In some instances it is necessary to use an acid wash or some other neutralizing medium before applying any dressing to concrete floors.

When the concrete is thoroughly dry and seasoned, two coats of concrete floor dressing should be applied. Making a cement mortar veneer of one-half inch thickness, and applying two coats liquid cement upon the surface, after the same is thoroughly dry, produces a sanitary and light radiating basement.

Concrete floors having exceedingly fine, close texture, floated to a dense surface, which carry at times a semi-gloss finish, should be treated as follows: The surface should be gone over lightly with a carborundum rubbing brick in order to establish a bonding surface that will enable the concrete floor dressing to knit close to the floor structure and practically become integral with it. This will prevent scalping and peeling of the floor dressing. The floors should, of course, be cleaned, thoroughly dry, and well seasoned before the first or priming coat of concrete floor dressing is applied. Transparent floor dressing of any color desired may be used. It should be applied by means of a suitable brush, preferably a flat 5- or 6-inch white bristle brush. The dressing should be worked well into the pores of the concrete, spreading it well over the floor surface to develop a thin film. The temperature conditions during the periods of application and drying should not be under 70 degrees Fahrenheit to insure the best results. The second coat should not be applied until the first or priming coat is thoroughly dried, which under proper temperature conditions requires from two to three days. The second coat should be brushed out evenly and uniformly over the surface in the same manner as one would apply a finishing coat of floor varnish, and it should be given from four to six days for thorough hardening. Two coats develop a very satisfactory result, though three coats should be used where floors are submitted to unusual wear, such as floors that are used as passages, aisles, and runways, over which heavy trucking is done.

Concrete floors of exceedingly coarse texture should be cleaned, thoroughly dry and well seasoned before the first or priming coat of floor dressing is applied. Either the transparent floor dressing or any color desired may be used, and should be applied by means of a suitable brush, such as is described for its use on concrete floors of fine texture. The dressing should be worked well into the pores of the concrete in order to bond and bind it thoroughly. The temperature conditions during periods of application and drying should not be under 70 degrees Fahrenheit to insure the best results. After the first coat is thoroughly dry all surface areas or spots which may show unusual absorption or penetration or floor dressing should be "touched up" or gone over with an additional coat of dressing, in order to prepare a uniform surface for the finish coat. After the first coat is thoroughly dry, the finishing coat should be applied, brushing same out evenly and uniformly over the surface, as described in the specification for concrete floors of fine texture. The finishing coat should be allowed to harden from four to six days.

Concrete floors of irregular texture—by which expression is meant those floors which are made up of extremely fine and extremely coarse texture, laid irregularly, which is sometimes due to carelessness, but often due to unforseen conditions—should be given a joint application of the specifications described for concrete floors of fine texture, and concrete floors of coarse texture.

Concrete floors of normal, uniform texture should be cleaned, thoroughly dry, and well seasoned when the first or priming coat of concrete floor dressing is applied. In this instance, as well as others, the transparent floor dressing, or any other color desired may be used, and it should be applied by means of a brush, and worked well into the pores of the concrete, spreading the surplus well over the floor surface to develop a thin film.

Floors which are laid in colors, such as terra cotta, green, etc., or where inert colors are mixed throughout the cement veneer or wearing surface, after being thoroughly cleaned, dried and well seasoned, should be given two coats of transparent floor dressing, applied under the same conditions as is described for the normal or uniform texture.—American Roofer.

Garden City Bank & Trust Building, San Jose
Binder and Schumacher, Associate Architects

The Work of William Binder, Architect

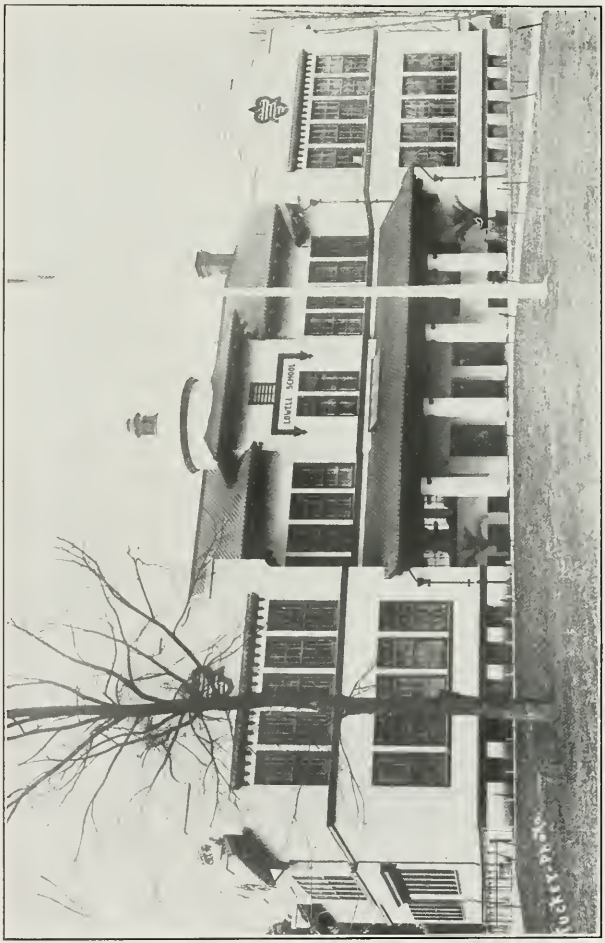
THE average loyal citizen has a certain amount of local pride and very naturally, he takes a deal of satisfaction and pleasure in the new improvements which help to make his "home town" a modern city. How much greater must be the joys of these pleasures to one who was brought up with the town if it falls to his lot to design the structures which contribute so materially to the new city.

Mr. William Binder, of San Jose, California, occupies this unique position. To say that he enjoys it is putting it mildly, for he is "chuck full" of civic pride and it is through his efforts that the architectural development in San Jose and vicinity has been brought up to its present standard. In recognition of his work, he has been called in on several occasions as consulting architect; more recently, on such work as the Hall of Justice and the new Elk's Building.

When the Conservative Realty Company of San Jose began to improve South First street, Mr. Binder was their advisor and it was he who persuaded them to build fireproof buildings. Reinforced concrete structures was the type adopted as it suited the local conditions ideally and in the long run is the most economical. While he is very familiar with construction details, Mr. Binder always employs a consulting engineer to design his structural work, realizing that a man specializing in this line can secure greatest economy, consistent with good construction. The Douglas Apartments, the Market and the New Russ House were the first of the group built in this district and on account of their success, a series of reinforced concrete stores and lofts were built and also the new Montgomery Hotel. This modern fireproof Hostelry has been a success from the very beginning and the same company is planning to build another much larger one.

Mr. Binder does not confine himself to commercial buildings but has designed and built some very excellent schools, fraternity houses, libraries, bank buildings, theatres and residences. At present he has under construction the large San Jose Y. M. C. A. Building, Twohy Apartments, Pleasanton Bank, Gilroy Theatre and a number of minor jobs. In his office at the present time he is preparing plans for a new San Jose Theatre of 1700 seating capacity and a splendid bath house for Alum Rock Park. All of these buildings are to be of the reinforced concrete type with brick and terra cotta for trimmings.

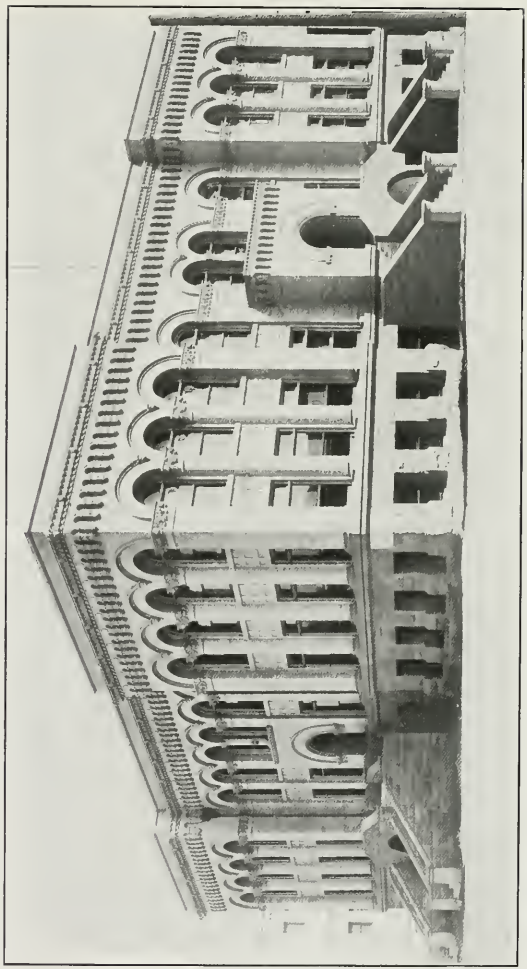
Mr. Binder is a member of San Francisco Chapter, American Institute of Architects.



Lowell Grammar School Building, San Jose William Binder, Architect

Carnegie Library Building, San Jose

William Binder, Architect



Hall of Records, San Jose

William Binder, Associate Architect

Bank of Milpitas *William Binder, Architect*

Fraternity House, Stanford University *William Binder, Architect*

Stores and Apartments, San Jose — *William Binder, Architect*

Y. M. C. A. Building, San Jose *William Binder, Architect*

Robinson-Binder Building, San Jose *William Binder, Architect*

Central Market, San Jose. *William Binder, Architect.*

Home of Truth, San Jose *William Binder, Architect*

New Russ Hotel, San Jose *William Binder, Architect*

Douglass Apartments, San Jose *William Binder, Architect*

Jose Theatre, San Jose *William Binder, Architect*

Santa Clara High School Building *William Binder, Architect*

The Smith Residence in Naglee Park, San Jose *William Binder, Architect*

Design for Plaster Bungalow, San Jose *William Binder, Architect*

Latta Residence, San Jose *William Binder, Architect*

Archer Residence, San Jose *William Binder, Architect*

Repairing Concrete Surfaces

AT the recent annual meeting of the American Railway Engineering Association, in Chicago, the Committee on Masonry reported as follows on the subject of repairing surfaces:

In all cases the surface to be repaired must first be thoroughly cleaned of all loose material, laitance and dust and the clean, rough, sound concrete exposed to receive the patch. Probably the best method of cleaning is by means of a steam jet.

After cleaning, the surface to be repaired must be thoroughly saturated with water, not simply moistened, but so thoroughly drenched that the old concrete will not absorb water from the new mortar or concrete used in patching. If possible, the surface should be kept covered with water for several hours.

If the repair of patch is to be made on a vertical or sloping surface and is not to be more than 1½ inches thick, the surface of the old concrete, while it is still wet, should be spattered or splashed with a cement grout, following this immediately with a fairly stiff plaster coat of mortar made of the same proportions of cement and sand as was used in the original concrete, but never richer than 1 cement to 2½ sand. This plaster coat should not be thicker than ½ inch, and each coat should be forced into the surface, but not dragged with a trowel. The surface of each coat, except the final coat, should be "scratched" to give a bond for the next coat. This plastering should preferably begin at the top and progress downward, and only enough time be allowed to permit each coat to receive its initial set before the next coat is applied. The final coat should be finished with a wooden float and only enough water used to properly finish the surface. This patch should be kept damp and protected from sun or frost till fully set up.

If the repair or patch or "finish coat" is to be made on a horizontal or nearly horizontal surface, the surface of the old concrete should be slushed and broomed with a thin cement grout, following this immediately with a wet mortar made of 1 part cement and 2½ parts sand or granite screenings and of the full thickness required (not less than ½ inch thick, however). When this mortar begins to take its initial set, it should be floated or troweled to such a finish as may be desired.

If the repair or patch is to be made on a vertical or sloping face and is to be more than 1½ inches thick, it will be advisable to imbed dowels into the old concrete, as deeply as the thickness of the proposed patch, and spaced sufficiently close together to firmly anchor the patch to the old concrete. The dowels must be wedged into the old concrete and it will be advisable to fasten wires, metal fabric or bars to the dowels, in the case of extensive patching, as an additional safeguard. The patching may then be done with mortar without forms, or with wet concrete supported by forms, depending upon the thickness and the extent of the patch.

If the repair or patch is to be made on a horizontal or nearly horizontal face and of considerable thickness, dowels may be used, or the concrete may simply be reinforced by fabric or bars without using dowels—treating the patch as a block of masonry.

Care must be taken not to have thin edges on patches. To avoid this, it may be necessary to cut out sound concrete around a place to be patched, so as to give deep edges to the patch. If possible, the edges should be undercut.

* * *

Before Election

Teacher: "Now, then, Johnny, can you tell me how the earth is divided?"
Johnny: "Yessum; into Republicans and Democrats."

What is a Carload of Cement?

FOR many years it has been the custom of dealers to place their orders for carloads of cement in round numbers, such as 100, 150, 200 or 250 barrels. None of these figures, however, represents a carload. Every dealer knows that box cars are built and marked with a certain capacity. These capacities are 40,000, 50,000, 60,000, 80,000 and 100,000 pounds. There used to be a 30,000 pound car, but none of these have been built for many years, and this size no longer is an element in transportation problems. Even the 40,000 and 50,000 pound capacity cars are very scarce and rapidly disappearing. The maximum load which can be placed in any car is ten per cent in excess of its marked capacity.

It is a well recognized fact that the railroads in the United States for the last three years have purchased only such cars as necessity compelled them to buy. Furthermore, many of them have permitted their rolling stock to reach a bad state of repair and have done but little to restore it to usefulness. The result is an actual deficit in this country of several hundred thousand box cars in the number required properly to handle the country's freight.

The duty, therefore, of extracting from every car its maximum service is apparent to all. The railroads quite reasonably dislike to have their cars loaded below capacity, because this reduces pro rata the efficiency of the available rolling stock. In other words, if a car which will hold 280 barrels of cement is loaded with 150 barrels there remains 130 barrels of wasted room in the car, and to waste room in box cars today is little short of criminal. For the information of our dealers, therefore, says the Universal Portland Cement Company in a recent bulletin, we publish the following table of carloads of cement:

Marked Capacity of Car.	Maximum Load.
40,000 lbs.	115 bbls.
50,000 lbs.	140 bbls.
60,000 lbs.	170 bbls.
80,000 lbs.	230 bbls.
100,000 lbs.	280 bbls.

Railroad tariffs in different territories provide different minimum weights for carload shipments of cement, ranging from 38,000 to 50,000 pounds and in the case of certain short hauls, the minimum is 60,000 pounds.

If the dealers will bear these figures in mind when ordering cement and will specify quantities corresponding with the above specified maximum loads and, of course, subject to the minimum weight restrictions applying in their respective territories, it will materially assist the railroads and the manufacturerers, and greatly facilitate the movement of freight.

Every car that is loaded to less than capacity imposes upon some other car an undue burden. An accumulation of such burdens means that from 50 to 100 per cent more cars are required to do a given amount of work than would be necessary if all the cars were loaded to the limit of their carrying capacity.

Further than this, everyone owes it as a duty to the public at large to assist in conserving the existing car supply to the greatest extent possible.

The following paragraphs will make clear how maximum service can be obtained from the available car supply:

"One car, any size." This is the way we would like to have an order read when it is immaterial to the dealer whether he gets a car of the minimum

weight prescribed in the railroad tariff, or the largest car which may be available, loaded 10 per cent in excess of its marked capacity.

"One car not to exceed 170 barrels." This is the way an order should read when a car ranging from minimum to 170 barrels is what is wanted. In this case we can use a 40,000, 50,000, or 60,000 pound car, which ever is easiest obtainable, and load it to the maximum.

"One car, 170 to 280 barrels." An order reading in this way will enable us to use either a 60,000, 80,000, or 100,000 pound capacity car.

It is impossible to overestimate the importance of this matter, and until the railroads equip themselves with sufficient rolling stock to perform the work they are called upon to do, no dealer should order cement in other units than the above mentioned carload lots. Our dealers are urged to give this matter careful study and to properly instruct their employes who may have to do with placing shipping instructions.—Cement Era.

* * *

Original Plan for Housing

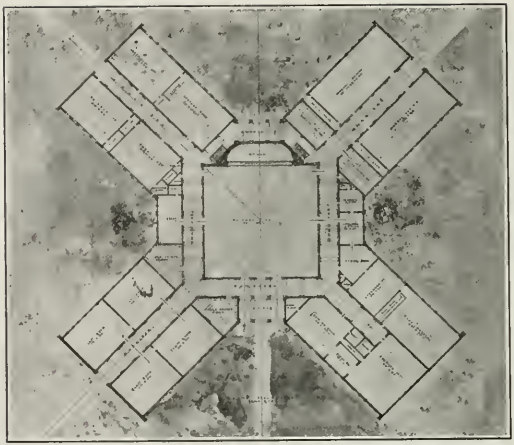
Prof. Pierre Roveda, an architect of Buenos Aires, has devised a special plan for the construction of whole districts of houses for the working classes. Instead of employing the usual square block as a unit, Prof. Roveda adopts a circle varying in diameter from 100 to 130 yards. This circle of ground is subdivided into 99 radial lots converging to a center. The circle is concentrically divided to form an interior avenue four yards broad, to permit of communication with the center of the circle. Each avenue leads to external sidewalks and to longitudinal and transverse streets. In the center of the circle is a plot of 40 yards in diameter, where children may be left to themselves without their parents' care, in charge of a specially designated person. In this garden a playroom, a school, a hospital, a fire station, and an administration room are to be found. Naturally this circular plot of ground will leave four corners free. In each of these corners Prof. Roveda intends to erect four chalets, such as grocery shops, dairies, haberdasheries, and the like, which are to be conducted on a co-operative plan. In each of the 99 radial plots a workingmans' house is to be built on the English plan. It is argued that the circular arrangement will give continuous sunshine at all hours of the day and plenty of light and air.

* * *

Price of Building Materials

Regardless of the fact that an immense amount of new building projects are being considered the price of building material has not advanced. This is particularly so in the case of building brick, and prospective builders may consider themselves extremely fortunate that such is the case. There is no denying the fact that common building brick are being sold cheaper at the kilns and on the cars in Los Angeles than in any other large city in the United States. This condition has been brought about by the fierce competition that has existed for several years between the several large brick manufacturers for the control of business and has caused several yards to go out of business.

The fact remains, however, that there is an increasing demand for building material of better and more fire-resisting qualities. The changes in the building ordinances, of which the requirements of up-to-date buildings have brought about, are making it necessary to specify none but the best material for the purpose. That the manufacturers of clay products are alive to the situation is apparent.



Ground Floor Plan, Dinuba School *Walter Parker, Architect*

Unique Design for a High School Building

THE new high school building about to be erected for the City of Dinuba, California, is of radically different design from the customary and time honored arrangement of floor plan. This building, designed by Walter Parker, contains all of the requisite rooms needed in this particular instance at the present time and also adapts itself readily to future additions in almost any desired direction, and with more or less satisfactory architectural results.

As may be readily seen from the plan, the building radiates around a central assembly hall which is well lighted on all sides from the clear story extending above the roof of the surrounding wings, and by reason of such location, long runs of corridor space is reduced to a satisfactory minimum.

The lot, almost a tiny block in area, being perfectly level, it is not necessary to confine the plan to a more compact arrangement, and a one-story structure spreading over considerable area being desirable, especially for a non-fireproof building.

The arrangement of floor plan does not conflict with the many requirements more or less imperative in the design of school structures and does, to a certain extent, take advantage of many of the desirable features obtainable only where circumstances and conditions are fortunate enough to permit a frank expression of a reasonable plan.

There is possibly a future for the "spider plan," for educational buildings where large areas for sites may be obtained for comparatively small investments, and for buildings that do not extend above the ground floor.

Elevation Dinuba School *Walter Parker, Architect*

Pleasant Words for Mr. Taylor

Supervising Architect James Knox Taylor, to whose brilliant management of this difficult office, the Treasury Department of the United States owes a series of public buildings fittingly symbolic of the best ideals of American architecture and who recently resigned to take up private practice, has succeeded in administering the affairs of his office in accordance with the code of ethics laid down by the American Institute, in complete sympathy with the highest ideals of architectural practice and with the most notable freedom from every taint of scandal, friction or favoritism. His tenure of office has reflected credit upon American architecture as well as upon the architect as a working unit for the artistic uplift of his community.—Builders' Guide, Philadelphia.

* * *

Radiators of Concrete

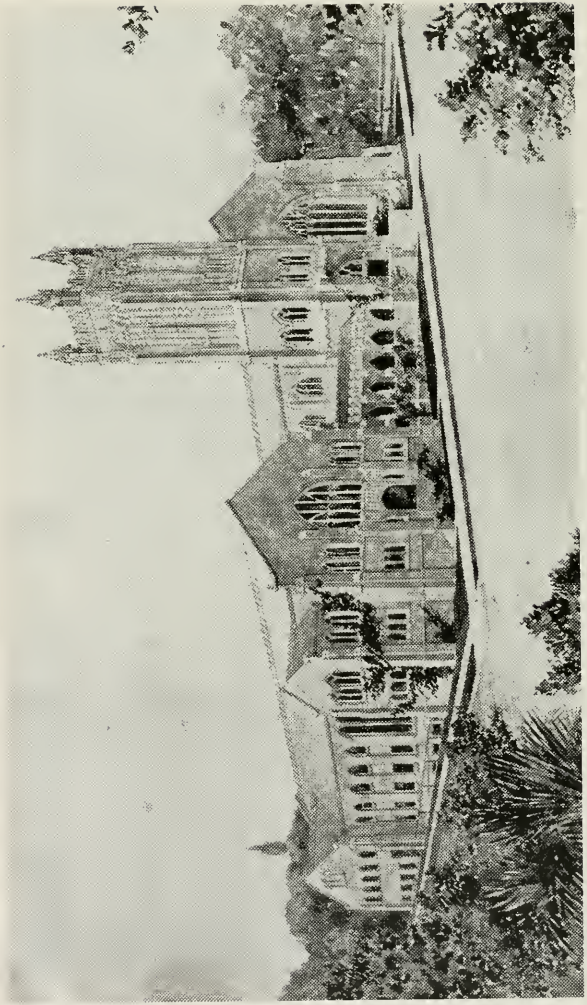
A radiator for steam or hot water constructed of concrete instead of cast iron or steel piping is a surprise, to say the least.

We find, says Cement Age, that it costs less, and moreover produces a better, more livable atmosphere. Once more we find an example of wonderful and unexpected development in the uses of concrete. Concrete radiators are apparently successfully established in Germany, and steps are being taken to introduce them here. Refrigerators and radiators, the extremes of household equipment, can both use concrete to good advantage. Truly concrete is the material universal.

* * *

Australian Capital Competition

The competition for the Australian Federal Capital has been decided, and, according to press despatches, the successful competitor is Mr. Walter Burley Griffin, of Chicago. Quite naturally the success of an American architect in a competition that was open to the profession generally will be regarded by architects in this country with much satisfaction, although the honor would have been greater had the competition been conducted along lines generally approved by architectural organizations of the United States.



Accepted Design for Methodist Church, San Diego, California — Robert H. Orr, Architect

What Advertisements Mean to the Contractor

ADVERTISEMENTS may be grouped into three classes: first, publicity cards; second, reading advertisements that tell of products; and third, educational advertisements. The first is not of great value, except to the advertiser, and then only when some purchaser is sending to a number of dealers or manufacturers for catalogues or prices. Such an advertisement consists only of the name and address of the seller and the article or articles for sale. Inquiries or sales from such advertisements are seldom numerous. Reading them does no one any good.

The second class, namely, reading advertisements, may not only educate the readers, but may be the means of saving them much money. Such an advertisement contains a lot of print telling of the products advertised, either the work they will do or how they are manufactured and kept in stock, or it may tell a story, by reproduced letters or otherwise, of the success of some users.

The third class, educational advertisements, are similar to the second, except they are given over entirely to educating the reader. It may be that at present the reader is not a possible purchaser, but with the proper education he may soon become one. Such advertisements may be devoted entirely to instructing the public concerning an article manufactured and sold exclusively by the advertiser, but may also be used to boost a product of similar grade made by a number of manufacturers. Then the advertisement may do almost as much good to other manufacturers as to the advertiser who is paying the bills. This was the case a few years ago, when one of the leading cement companies spent thousands of dollars in educating the general public in the use of cement. This was some benefit to all the cement companies, but gave the one which paid the bills some prestige over the other companies.

All reading advertisements, both those referred to in the second and third classes, can be, and generally are a benefit to the reader. Advertisements, as a rule, are worded as strongly and as strikingly as the truth will permit, and for this reason they are impressive and may start new ideas and chains of thought in the mind of the reader.

An evidence of the power of publicity is the use of concrete mixers. Ten or fifteen years ago few were used. At present thousands are in use, and those that are best known and used most extensively are the most advertised ones.

The introduction of machines on contract work means the saving of thousands of dollars over hand labor to contractors. If a contractor does not read advertisements, he cannot keep himself posted concerning new machines that are placed on the market. To-day, he may not need a certain new machine, but within a year he secures a new job upon which such a machine can be used. His mind at once reverts back to the advertisements he has read. Possibly, the name of the manufacturer is impressed on his memory. He secures a catalogue or hunts up an old one, makes a purchase and reaps an added profit on his work. Knowing of such a machine, it is perhaps possible for him to underbid his competitors who are not readers of advertisements and so secure the job, when otherwise he would not have been among the low bidders. Such things have actually happened not once, but many times.

New uses for old machines are also told of in the advertising pages of the technical papers. A contractor finds that a certain machine is well adapted to some new class of work and informs the manufacturer. This information

is published in his advertisements and the readers of them reap this benefit at once instead of waiting to discover it by chance, as did the original contractor.

As descriptions of machines and their uses, so methods of work and many good ideas as to management of a business are found in advertisements. One steam shovel company has for years published advertisements illustrating methods of doing certain classes of work. Another company selling some classes of excavating and rehandling machinery has told in its advertisement much that is of value in reducing costs even to those who have never bought a thing from it, and possibly never will. A dump wagon company, in boosting its own products, has laid down many good business principles and valuable hints on buying.

Often an advertisement is meant for one purpose, yet it will start a chain of thought in the reader's mind that will lead him to thinking, so that he will originate new ideas or think out things that will be a benefit both to himself and others.—Extract from the Contractor, Chicago.

* * *

Cracked Concrete Chimneys

SANFORD E. THOMPSON, in a report dealing with the cracked concrete stack of an English manufacturing plant, discusses conditions and some possible remedies which are of interest to those American manufacturers who are burdened with big stacks built on the unhappy principle of a dry-mixed concrete. In the case of the London chimney, the structure had been put up on the dry-mix plan that was in vogue some years ago. The lower third of the stack was of greater diameter than the upper portion, and in the region of the offset, and above it, there were many long vertical cracks. The internal temperature of the stack was pretty evenly maintained throughout the year by the usual operation of the power plant, and there was some leakage through the cracks from the outside. The main concern of the owners, however, was as to the stability of the stack.

Danger from shearing stresses was considered very remote, since such stresses would not reach a critical point until long vertical cracks had formed on opposite sides of the chimney; and even then, an adequate amount of horizontal reinforcement would prevent the disruption of the stack. Corrosion and consequent weakening of the reinforcing steel was considered the point of most danger, the probability of this being rather large in case of concrete mixed so dry that it did not make a perfect bond with the reinforcement. With wet-mixed concrete, says Mr. Thompson's report, the reinforcing steel is usually covered with a film of cement which will for a long time prevent corrosion of the steel by gases and moisture making their way in through the cracks.

As to remedies, the placing of a fire-brick lining was considered undesirable; such a lining would protect the concrete of the stack to some extent against the heat, but as good concrete easily resists a steady temperature of 600 to 700 degrees F., there was no need of a lining on this score. Moreover, it was considered that the presence of the lining might be mischievous through the new expansion strains which it might transmit to the concrete structure.

Repair by placing a shell of new concrete on the outside of the stack was considered by Mr. Thompson much the best course to follow. It is possible in building such a reinforcing shell, to shut off all access of atmos-

pheric gases and moisture to the reinforcing members of the original structure, and to use reinforcing steel in such a way as to make good the weaknesses that have developed in the original structure owing to cracks, or to a presumption of an insufficient bonding of the reinforcement due to too dry a mix.

* * *

Cause and Prevention of Concrete Failures

It is a peculiarity of the failure of every concrete structure, where the primary fault is in the design or construction of the concrete or of its reinforcement, that a very apparent cause can soon be found, and that that cause is one which should have been apparent to anyone claiming more than an elemental knowledge of the science of building in concrete.

With a regularity almost monotonous we read of insufficient reinforcing connections, of improperly mixed concrete, of frozen material, of thin supporting struts, and of premature removal of forms, until we wonder what is the nature of men who will not learn the fundamentals of a business at which they hope to earn their living.

There does not seem to be any good reason why the concrete building business should not be conducted in the same manner as the building of steel structures. Why should not every architect be competent himself or have associated with him an engineer competent to design the concrete structure? Why should not this expert prepare the general structural drawings for the building upon which competent contractors may bid? Once the bid is awarded, taking into account both the competency of the bidder and the prices bid, the successful contractor could himself prepare the detail plans showing method of erection, minor steel details, etc., exactly as the steel companies now prepare shop drawings showing erection methods and connection details for the approval of the designing and supervising engineer of a structural steel building. This would remove the commercial element from design and would surely tend toward safer buildings. Such methods are very generally in use, and the buildings so erected are of the class which make the reputation of reinforced concrete as a building material.—From Engineering News.

* * *

A Clayworker's Epitaph

It was a fitting tribute to the life and work of Anton Vogt, Jr., son of Anton Vogt, the well-known American kiln expert, that the monument, recently erected on his grave at Guildford College, N. C., should be of clay. The monument was in the form of a cross and was made of terra-cotta, with a white enamel finish. The inscription was especially appropriate:

"He was of clay, he worked in clay,
He died as clay and returned to clay."

* * *

No Grammar Desired

A school teacher having instructed a pupil to purchase a grammar, the next day received a note thus worded from the child's mother: "I do not desire for Lulu shall ingage in grammar, as I prefer her ingage in yuseful studies and can learn her how to spoke and write properly myself. I have went through two grammars and I can't say as they did me no good, I prefer her ingage in German and drawing and vocal music on the piano."

Los Angeles Athletic Club Building, Los Angeles, California
John Parkinson and Edwin Bergstrom, Architects

Ancient Greek Frieze Decoration for Fireplace *Modeled by Ignace P. Lipp*

Among the Architects

American Institute of Architects

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Meets Third Monday Each Month.

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Want Competition.

Architects William Mooser, Kenneth MacDonald and W. G. Mitchell appeared before the Public Buildings Committee of the San Francisco Board of Supervisors recently, and spoke in favor of holding a competition for designing the various public buildings to be erected in the San Francisco Civic Center. Several days prior to the meeting the Supervisors were requested to appoint a committee of architects from the Civic Center Commission to prepare the plans for the new auditorium, and this action aroused so much adverse feeling on the part of many of the San Francisco architects that it was decided to petition the supervisors to call for competitive plans.

Six-Story Apartment House

Architects Welsh & Carey of San Francisco have plans for a six-story and basement high-class steel and reinforced concrete apartment house to be erected on the site of the old Grace church at California and Stockton. This will be one of the most completely equipped and elaborately furnished apartment buildings in the city, and will be a credit to the aristocratic section of the New San Francisco. Building is for Soule Dolliver, and will cost close to $100,000.

Branch Bank Building.

Architect Herbert A. Schmidt has prepared plans for a one-story and basement class A branch bank building to be erected at Twenty-first and Mission streets, San Francisco, for the German Savings & Loan Society. Construction will be of white stone and granite, with interior of marble and tile and mahogany finish.

Architects Curlett & Son Busy.

One of the busiest firms of architects in San Francisco at the present time is William Curlett & Son, who have more than two million dollars' worth of work under way. This includes a one-million-dollar bank and office building for Los Angeles, a $200,000 annex to the Hotel Argonaut, $100,000 steel and brick apartment house for James McElroy and a 300-room hotel for R. D. McElroy.

Seven-Story Hotel.

Architects Righetti & Headman are completing the working drawings for a seven-story and basement steel and concrete hotel to be erected at Ellis and Larkin streets, San Francisco, for J. Allec at a cost of $85,000. There will be five large stores on the ground floor and sixteen rooms on the six upper floors.

Exposition to Pay Architect's Fees

The Directors of the 1915 Universal Exposition have called upon the supervisors of San Francisco to designate its advisory board of architects as the architects to plan an auditorium which will be in harmony with the other contemplated buildings in the Civic Center. The Exposition is to meet the expense of drafting the plans of the auditorium and the magnificent structure is to be erected under the supervision of the World's Fair. The sum of $40,000 is to be expended for the services of the designing architects. Contracts for its construction will be awarded immediately after the plans have been decided upon.

Civic Center Site Decided Upon

The location of San Franciso's new Civic Center has been decided upon once and for all time. The supervisors have selected the best site available, namely that known as Scheme B which takes in the block bounded by Van Ness avenue, McAllister, Polk and Grove streets.

In speaking of the selection Architect John Reed, Jr., of the Civic Center Commission, said: "The action of the Board of Supervisors is in accord with the judgment of all members of the Architectural Commission, and, is in my estimation, the most logical The old City Hall site presented many difficulties in the way of construction of the new building that will not be encountered at the Van Ness avenue site. I feel pleased with the result of the action of the Supervisors and know that the other members of the Architectural Commission are also pleased."

The supervisors voted 14 for the Van Ness avenue site and four against. John Galen Howard and John Reed, Jr., appeared before the Board on behalf of the Architectural Commission to explain the stand of the commission.

The Western Pacific Shops at Sacramento

After several months of quiet, during which some Sacramentans wondered if the Western Pacific had abandoned its plans to erect its principal shops in Sacramento, the shop site adjoining South Curtis Oaks early this month again showed signs of activity. Architect W. H. Mohr, who is in charge of the work of completing the shops, is assembling a large force of men to rush the buildings to completion.

Work is now in progress on the storehouse and office building. These structures will likely be the next ones completed.

The Western Pacific shop buildings when completed will represent an outlay of about $400,000. The modern machinery to be installed in the buildings will cost as much or more than the buildings.

Money for California Federal Buildings

The sundry civil bill recently passed by the House in Washington, makes available the following sums for California federal buildings and construction work:

Riverside postoffice $5000; Pasadena postoffice, $5000; immigration, station Angel Island, for water barge, $3000; Grass Valley postoffice, $20,000; Alameda postoffice, $45,000; San Diego postoffice and courthouse, $10,000; Humboldt harbor and bay, $250,000; San Francisco sub-treasury building, $100,000; Yosemite National Park, $50,000; Sequoia National Park, $2000; San Pablo bay improvement of channel over Pinole shoal, $122,000; California Debris Commission, $15,000; salaries of United States fishing stations at Baird and Battle Creek, $5280; Soldiers' Home at Santa Monica, $401,000.

Carnegie's Money is Good

San Francisco, through its Board of Supervisors, has finally announced itself as pleased to accept $750,000 of Andrew Carnegie's money for the construction of a public library. The board is willing to forego any careful scrutiny of the method by which Carnegie accumulated his millions by trust manipulation and underpaying laborers, if he will only make good his offer of 11 years ago. His wealth is not looked upon as loot, and is therefore not so tainted but what San Francisco's self-respect does not forbid it to accept the gift.

Architect Wins Prize.

Architect Arthur S. Heineman was recently awarded the first prize and $150 for offering the best suggestions for the development of a large tract at Oakland for the Wickham-Havens Company of that city. The tract is one and one-fourth miles in length and three-fourths of a mile wide. It will contain about 3000 lots which will be devoted exclusively to bungalows. In order to secure the best ideas for the comprehensive development of the tract the company offered prizes and invited a number of architects to submit letters containing their suggestions and ideas. No plans or sketches were asked for or submitted.

Back Numbers Wanted

The Department of Civil Engineering, University of California, would like back copies of the Architect and Engineer for binding as follows: Vol. 19, No. 2, Dec. 1909; Vol. 21, No. 1, May 1910; Vol. 25, No. 1, May 1911. Prof. Derlith writes: "If you can furnish us with these missing numbers so that our files may be complete for binding, we shall greatly appreciate it and will remit by check upon receipt of the numbers and your bill.

Honor For Retired San Francisco Architect.

John C. Cebrian of 1801 Octavia street, retired capitalist and formerly well known as a civil engineer and architect of San Francisco, has just been knighted by King Alfonso XIII of Spain for distinguished services and achievements in art, architecture and literature.

Cebrian was named knight commander of the Order of King Alfonso XIII, the last week received the decoration of that order, which is one of the highest given by the Spanish court. The decoration consists of a cross showing an eagle with outstretched wings flying before the rising sun and is surmounted with the arms of Spain and the crown of Alfonso XIII.

Cebrian was a native of Spain, but has spent most of his life in San Francisco. He won early recognition for his work, and during the last few years has gained particular distinction for his valuable gifts of books on art and architecture to the University of California and to the library of the School of Art and Architecture in Madrid.

Portland Architects.

About fifty members attended the recent annual meeting of the Portland Architectural Club at the Bowers hotel. An amendment to the constitution was adopted which puts all of the business under the board of governors, who make a report once a year to the club. The monthly meetings in future will be of a social nature under the management of the entertainment committee. The following officers were elected:

Frank Logan, of the firm of Larzarus & Logan, 1000 Chamber of Commerce building, president; John M. Hatton, with Doyle, Patterson & Beach, Worcester building, vice-president; William P. Dawson, with Emil Schacht & Son, Commonwealth building, treasurer; and William H. Flanigan, with Whitehouse & Fouilhoux, Wilcox building, secretary.

After the banquet and election of officers, the members repaired to their rooms at 247½ Stark street, where a temporary stage had been put in, and an amateur entertainment was enjoyed.

Personal

Architect William H. Weeks announces the removal of his office from 251 Kearny street, San Francisco, to 75-77 Post street, near Kearny. Mr. Weeks has a long lease of the entire top floor which has been especially fitted up for his constantly growing clientele.

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THE "TARNSEY" ACT

By F. W. FITZPATRICK

In some quarters there is heard a wail because Congress plans the abolishing of the "Tarsney" Act, that legislation whereby the biggest Government buildings have been given out to private architects via the competition route. That those of the inner circle who have generally secured the plums should wail is understandable but that the profession generally should protest simply goes to show how abjectly the rank and file follow the lead and uphold the interests of the aforesaid "inner circle." The profession at large has not been benefited by the Tarsney Act nor has it been of advantage to the government and therefore to the people generally.

The proposed repeal is in the Sundry Civil Bill so is more than apt to pass whether the Institute protests or not. That protest, as far as the rank and file are concerned is perfunctory and simply because the Act originated in the Institute. A case of upholding a thing because one suggested it and utterly regardless of whether it did good or harm, what is called a "blind partisan support."

I think I am perfectly safe in saying that the legislation has done no good. The buildings carried on by private architects have been no better than the regular Government product, have been the cause of endless rows and trouble and have cost more to produce than those done in the usual way. I have followed the Tarsney Act products rather carefully, have had much to do with some and believe that I am competent to affirm that that legislative effort is a good one—to repeal.

The private architect has to get his information from the Supervising Architect in order to plan the building. The latter office, in the natural course of things, must have forgotten more about the needs of a Government building than the private practitioner can learn in a lifetime. Then the supervision of the work is done

by the regular Government force anyway; so are the accounts kept by it. It all means endless duplication of work by department and private practitioner. Really the only thing the latter rules supremely is the artistic part, the exterior design and the interior finish. And I fail to find a solitary instance where the private architect has produced a handsomer, a more artistic structure than those designed by the Supervising Architect's office.

The Tarsney Act was passed because the Government work had been so abominably ugly and because of the endless scandals and crookedness that had existed in handling it. But contemporaneous legislation and new appointments cleaned up that office and so effectually that for a long time now it has been known that the Tarsney Act was simply a means of giving good fat commissions and extra renown to a few select architects and not the remedial legislation it was originally planned to be.

A much better scheme would seem to be "collaboration" rather than these so-called "Tarsney Competitions." Let the Supervising Architect's office design and carry on and build the Government buildings. It is the best equipped and most capable office in the land for that function anyway. Then appoint and pay a "Collaborating Commission" of private architects to work with the Supervising Architect to secure the best and most artistic structure possible. That is in the big cities only, of course, buildings of $300,000 or over. Let it be a local Commission, three or four of the best local architects, men of ability, men elected for that work by their fellows or local Chapter of the A. I. A.

Such a Board of Commissioners will have local pride enough to really exercise its privileges of criticism and suggestion and see to it that that building will be one worth while; the knowledge that there is to be such a Board that will go over its work will keep the Supervising Architect's office always keyed-up to its best, and the combination of the two bodies, really collaborating and working together, cannot fail but produce infinitely better results than that achieved by an individual who has merely happened to hit the fancy of the best talker of the judges who preside in the more or less farcical competition performance.

The Government competition is pretty sure to be a dead letter ere this is in print and I would most earnestly advise the architects to clamor for "COLLABORATION" as a new plank in their platform. A trial is the least that could be done. If they want it let them get busy and approve of the scheme to their legislators and representatives to whom it will already have been suggested.

The Old Man.

Who says that this is the age of the young man? It is the noisy young fellow who perhaps is making a spectacular flight. Very little thought will show that spectacular flights do not as a rule have pleasant endings. Give us the man who matures not too quickly and learns to work patiently in harness with others. There are thousands of them, all the way from fifty to ninety years old—you meet them everywhere—who are getting such results out of life that they are quite content to let others make a noise and attract the passing attention.

In this connection we were pleased the other day to read the following by a leader in Chicago business life:

"Among the men I hire nine out of ten are better workers at 45 years of age than are the men of 25 or 30."

This man believes that the man of 45 or thereabouts is at the prime of life, physically and mentally. He also holds that men of mature years are more reliable and less apt to become restless after a year or two in a position and to seek new fields. The average young man, he says, is seeking a "soft snap," and is not the sort of employe who will stick by his employer through thick and thin until his services become highly valuable, and, in many cases, indispensable.

Want to Know About Concrete?

The Architect and Engineer, of California, has opened a new department for young draughtsmen. The purpose is to have them send in inquiries concerning the problems they may encounter. In the first issue containing the department, fifteen questions were presented, and it is significant to note that six of them related to cement and concrete construction. In other words, nearly half of the queries were confined to the use of a single material—cement.—Cement Age.

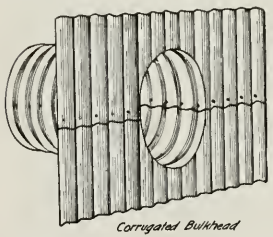
State, County and Municipal Engineering

Good Roads—Water—Sewers—Bridges—Fire Protection

Irrigation and Protection of Reclaimed Lands

By Ray L. Anderson

SENATOR Ingalls said that the bed of the Platte River in Kansas "would make splendid farming land if it only could be irrigated." The reclaimed swamp lands of the Sacramento and San Joaquin Rivers are in many respects the richest agricultural areas in the world; and strangely enough, to anyone unacquainted with California conditions, the principal problem in their development is that of irrigation. More exactly, the difficulty lies in drawing the proper quantities of water from the river during half the year, and excluding ruinous torrents during the other half.



Corrugated Bulkhead

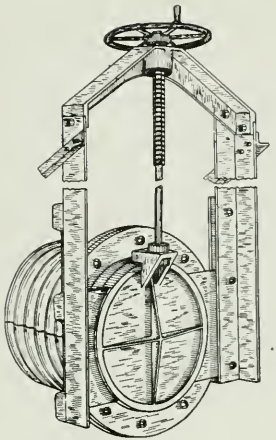
The matter seemed at first a very simple one—to let water flow from a higher level to a lower was something like the proverbial rolling off a log. But, just as Darius Green found it much easier to fly than to "light" so the Island Country ranchers have found by hard experience that a pipe or other conduit may work beautifully during the summer and fall, and be the means of starting a flood in the spring which will do a hundred times more damage than all the good it has accomplished.

The peculiar conditions of the Island Country make it somewhat difficult to select the best material for a conduit. The soil, for unknown depths, is of a peaty character, affording no adequate bed for anything of the nature of masonry. For this reason, conduits of brick, tile or concrete are found to be absolute failures, for none of these can endure the strains incident to a shifting foundation. Wood was of course one of the first things used, but the employment of so temporary a material was soon found to be the very opposite of economical. Weather conditions are decidedly unfavorable to wooden construction; and it often happened that such a waterway needed replacing after one or two seasons. When a replacement is needed in a pipe which runs through a levee the island rancher is fortunate indeed if he discovers it before the river does.

Ordinary sheet steel pipe, whether asphalt coated or galvanized, is hardly more permanent than wood. Corrosion begins almost immediately, and some of this pipe after two or three years' service is in a ruinous condition. Cast iron pipe, with shoulder-leaded joints, has also been turned to as a possible solution of the matter. Rust would of course be a long time in eating its way through such a thickness of metal, and no such immovable bed is necessary as with brick or concrete. This pipe, however, is heavy and expensive, and costly experience has shown that it must be absolutely supported at the joints. Its weight often causes it to settle in the soft levee soil, which in many cases leads to the breaking of the joint; and it does not require an engineer's education to enable one to foresee the consequences of a broken pipe joint in the middle of a levee.

Sheet steel, cast iron, wood and every other form of smooth pipe has also a common defect which is fatal for this purpose. A trickle or ooze of water may at any time make its way along the outside of the pipe, that point being the weakest in the levee. Under flood conditions this trickle may very quickly become a stream, and the stream a raging torrent. Many a conduit has been ruined and thousands of acres flooded by this cause alone.

The consideration of all these dangers arising from various forms of pipe leading through the levee has convinced



Cast Iron Head Gate

some engineers that the only advisable method of taking water from the river is that of the true siphon, carrying the water over the levee top. This certainly avoids many of the difficulties attending the straight conduits; but it is, after all, very doubtful whether it constitutes a solution. The siphon is vastly more expensive and difficult to install, and it must remain air-tight in order to be effective. Under rough and ready conditions, this last is a severe requirement. The siphons are also a serious obstruction to dredging and other operations along the river bank.

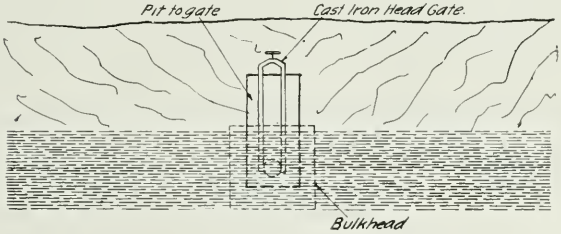
Several land owners are reporting the successful use of corrugated iron for levee pipes. This material is becoming familiar through its use for road culverts, where it seems to fill the bill perfectly. The corrugations increase its strength immensely over that of plain pipe, thus allowing the use of lighter gauges; and they also serve to grip the soil and hold the pipe firmly in its bed. The earth packs closely into these corrugations and prevents the formation of the trickle that brings disaster in its wake.

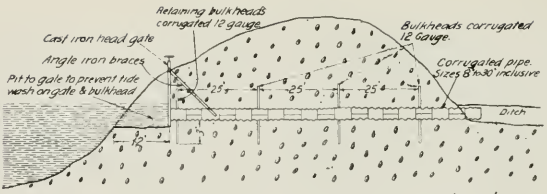
The construction of this type, in two-foot, riveted sections, is one that gives a maximum of strength, combined with elasticity. It withstands the strains resulting from a soft or shifting bed better than anything else, for there is just enough "give" in the material to provide for this. Culverts made in this way are now to be seen all over the country, replacing masonry or other rigid constructions, where the conditions are such that the latter never could be successful.

Corrosion, the great enemy of sheet metal construction, is guarded against, in the better grades of corrugated pipe, by the use of high-purity iron. It seems now to be pretty well established that the principal cause of corrosion in iron and steel is the impurity which it contains; and experience with wrought iron of the highest guaranteed purity in culverts and other exposed iron work seems to justify the conclusion that it will be more permanent than even the fine old iron of seventy-five years ago, which the scientists tell us was also a high-purity product.

The makers of this pipe have designed bulkheads or wing-walls of the same material, for a further protection of the inlet end. They have also perfected a heavy pressure gate for use in connection with the pipe which is admirably adapted for regulating the intake. It consists of a cast iron slide attached to an angle iron frame, which supports a wheel lifting device for raising or lowering the slide.

So far no failures resulting from the use of corrugated iron pipes and bulkheads in levee work have been heard of and from present indications it would seem to indicate that they constitute the best material obtainable for that purpose.




Retaining bulkheads corrugated 12 gauge
Bulkheads corrugated 12 Gauge.
Cast iron head gate
Angle iron braces
Corrugated pipe. Sizes 8 to 30 inclusive
Pit to gate to prevent tide wash on gate & bulkhead
25'
25'
25'
Ditch
Height of pipe to be determined by outlet end. Slope of pipe 1 in 300'

To Treat Sewage With Electricity

An electric sewage disposal plant, the first to be established in Kansas, is to be installed at Eldorado by the engineers of the state university and the state board of health. The state board of health, which has general supervision of the sewage disposal in Kansas, is going to make a complete test of the new plan of removing all contamination from sewage, and if the experiment is successful similar plants will be required wherever it is necessary to prevent the danger of spreading disease to other towns. Prof. W. C. Hoad of the state university, state sanitary and water engineer, describes it as follows: "The sewage passes through a trough just large enough to carry the materials, but small enough to make it run very slowly. Set in the trough are eight or ten sets of electrodes, and the sewage circulates around these. The electricity is turned into the electrodes at about three volts, but carrying about three hundred amperes. This large volume or current at low voltage disintegrates the sewage and kills practically all the organic matter and every germ. Experiments we have made just as a test show that this method of treating sewage reduces the danger of contamination to a minimum.

At Eldorado they are planning to establish a plant that will handle three hundred thousand gallons of sewage a day. The plant will cost from $700 to $800 completely installed and the cost of operation will be from 90 cents to $1 a day when running full capacity.

Concrete Country Highways Described.

F. H. Oakes, of Chicago, assistant engineer for the Universal Portland Cement Co., Chicago, addressed the highway committee of the Minneapolis Civic and Commerce Association last week, giving a description of the concrete highways in Wayne county, Mich. According to Mr Oakes, a portion of this roadway is in its fourth year. The county will build forty miles of it this year. The concrete is a one, two and four mix, laid seven inches deep, 16 feet wide, in 25-foot sections. It is steel protected and has frequent expansion joints. Along each side is a three-foot strip of tamping gravel. The county spent but $200 in repairing its roads last year, and a good portion of this was for cleaning ditches and repairing a few shoulders. The surface is roughened by sweeping it with a brush or broom. The concrete is made to set under wet sand to prevent rapid drying and avoiding cracks. The concrete is laid on a six-inch sand cushion, which serves to prevent any trouble from frost heaving.

New Pavement Proof to Autos

A press dispatch under Paris date line reads: "The broad and stately avenue de l'Alma is rapidly being put in a state of siege. Both the roadway and pavement are blocked with enormous and unsightly heaps of sand and granite rubble and piles of tar bricks and cubes, the whole forming a rampart around an enormous machine whose cylinder grinds without ceasing from mroning till night. The machine manufactures, it is said, a composition of incredible hardness—one that is able to defy the flying wheels of any traffic for ten years, while always presenting the same uniformly smooth surface. The cylinder simply crushes up granite and any other substances which it may be fed like walnuts. Finally it turns out a mixture that, combined with tar and cement, is to form the pavement of the future. The municipality is on the point of signing a first contract for $5000 worth on in self-defense, but its advocates claim that, on the contrary, it owes its durability in part to its smoothness and absence of friction."

Experiments With Marble Roads.

The village of Gouverneur, New York, is making the experiment of building its highways in crushed marble and asphalt. The foundation is laid in crushed marble well rolled. On this is poured a coat of hot asphalt and on top of that a covering of the crushed marble is placed and rolled, the asphalt acting as a binding. The entire cost of construction aggregates about $1,800 a mile. This is more than has been expended in road construction heretofore, but the marble highways will give such excellent satisfaction that the work will be continued on a larger scale than was originally contemplated.

HEATING AND LIGHTING

Plumbing and Electrical Work

Economy in Household Lamps.

The layman, and quite frequently some of us who profess to know more or less about the electrical industry, frequently operate lamps not only at improper voltages, but also over a period exceeding the useful or economic life of the lamp.

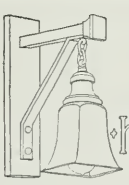
Some years have passed since it was established that a slight increase in voltage causes the lamp to burn many times its natural brightness, though to its detriment, and, again, a slight reduction in the voltage causes it to be unduly lessened in light-giving qualities. The subject, then, of installing lamps of proper voltage has been pretty thoroughly covered, and cases where improperly installed lamps are being used are comparatively few.

The burning of lamps far beyond their useful period is, however, still the ruling sin in household economy. As long as a ray of light is given out, the lamp is held to its inefficient service, even though the consumer is unwittingly paying many times the price per actual candle power delivered that would be necessary in case a new lamp were installed.

Let us for the moment look briefly into the theory of the economic use of the lamp. It is admitted at the start that the more watts used, the more the cost of energy becomes. On the other hand, if a lamp costs a certain amount of money, say 70 cents, and if it is burned 1000 hours, the cost per hour is one-half that of a lamp burning but 500 hours, consequently we see that the longer a lamp is burned the smaller the lamp cost per hour. On the other hand, the longer the lamp is burned, the greater is the cost of energy. These two costs constitute the total cost of lamp service.

If now, we can find the place at which the sum of these two factors—the one continually diminishing, the other continually increasing—becomes a minimum, we have at once the proper time at which to discard the old lamp for the new. On another page in this issue will be found the results of an investigation in lamp economy. There will be found a graphical representation of the two curves above alluded to and, also, a third curve, entitled total cost of watts per candle. The point at which this curve approaches nearest to the horizontal line is evidently the smallest cost in watts per candle, hence the point of greatest economy.

The inefficient use of the lamp in the household is comparable to the wasteful use of water. The modern high class system of irrigating canals is designed to deliver practically all the water to the



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orchard. The inefficiency of the domestic irrigator has led to a waste of nearly 50 per cent of this water. In the modern domestic supply of electric power, the power company delivers its energy in a manner that obviates every possible loss. The consumer, ignorant or heedless of economic lamp efficiency, wastes fully 50 per cent of the energy for which he monthly pays. The broadcast agitation on the part of the lamp companies to educate the public in the economic use of lamps is highly commendable, and is resulting in thousands of happier, brighter, and yet more economically lighted American homes.—Journal of Electricity, Power & Light.

Arranging House Wiring

THERE are many points in connection with house wiring which do not always receive that degree of attention at the hands of the contractor which they merit. The majority of these arise out of the character of the building, the scheme of decoration or the tastes of the householder or individual members of his family. Others depend on the principles of illumination and although these are now far better understood than was the case some few years ago, instances still arise where neglect or ignorance of these results in either pecuniary loss or loss of prestige to the contractor who carries out the work, and the dissatisfaction of the client for whom it is being done.

Possibly in no other class of electrical installation work does the final result depend so much on the artistic taste of the contractor as in house wiring. Certain it is that in no other branch of illumination does this question of taste occupy so prominent a position. Not only is it essential during the preliminary planning out of the distribution of the lights, but it comes largely into evidence, especially where the client himself does not possess it to a marked degree, during the discussion which invariably takes place as to suitable designs for fittings and the questions as to of what metal they are to be made and how finished. It also enters largely into such matters as the length of pendants, height of standards and patterns and colors of shades.

The question of cost is an important one, particularly in the case of small private dwellings. When electric light is installed in small property the householder is seldom disposed to spend so much, in proportion, on fittings and shades as is the occupant of a much larger residence. But during recent years such advances have been made in the design and finish of cheap and artistic electric light fittings that tasteful and correct styles for the various rooms may be obtained and installed without any extraordinary expenditure. In methods of wiring also such improvements have been made as to render it possible to save expenditure on wiring or cutting away, and to allow more money for the purely decorative side of the lighting. It is possible to install and even conceal some of the patent conductors for less than it would have cost a short time ago to run up wood casing in the cheapest possible way. Such systems of wiring naturally have their place also in the better class residences, where by their aid it is possible, without chasing in and sinking the conductors, to carry them over valuable old oak paneling or elaborate mural decoration, without them being even noticeable, much less conspicous. But in such cases artistic taste is more necessary even than the exercise of extreme care.

In other directions the character of house-wiring work has altered. The protection of conductors is now far from expensive, and compared with the haphazard systems at one time in vogue is quite a scientifically arranged matter. Now the contractor can employ either iron, steel, lead, brass, paper or fiber conduits, use one or other of several admir-

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able systems of metal molding, or at a slight extra cost can obtain capping and casing made with any design of molding and from almost any wood he desires. At one time, unless the householder was prepared to spend a considerable sum on the work, the contractor could do not more than run ordinary white wood casing up by the side of the door, over the cornice at an angle which did not render any cutting away necessary and so across the ceiling until the point was reached where the light was to be attached. If the householder did not mind the slight extra expense the ceiling casing could be concealed between the plaster and the flooring of the room above, but he had to put up with the unsightliness of the upright casings unless he was prepared to have the room repapered, in which event the casing could be sunk into the plaster.

But today wiring methods have improved, the looping-in system, to which objection has been raised in some quarters, has cheapened the cost of installation; the improved technical knowledge of the contractor, the foreman and the wireman has removed unsightly work from the interior of the rooms, and the finished installation of a few years ago, carried out in the best possible manner and with the best available materials, could not compare for a moment with even an average installation of the present day.

In the matter of accessories also the contractor has more scope for artistic selection than was at one time the case. Neat designs of switch-plates, ceiling roses and point switches or wall sockets are now within the reach of the most modest purse, where previously they were unobtainable unless specially designed by an artist and produced by a skilled metal worker to suit the requirements of some particular building and turned out in small quantities at almost prohibitive cost.

With regard to fittings, this is true to an even greater extent. Electroliers, pendants, brackets, standards and shades were frankly copied from the gas fittings then in vogue. Neither taste nor originality was shown, and no effort on the part of either the householder or the engineer carrying out the installation could do other than make the best of a bad job. Many householders attempted, with some measure of success, to improve the effect by making their own shades from silk or paper; others were compelled to regard the comfort and convenience of the electric light as inseparable from bad taste, and were content to endure electroliers with solid-looking downright rods, heavy cast-brass arms with lavish and coarse scroll work, fitted with colored shades of crude tints, generally etched with some inartistic floral or geometrical design. Now all that is changed, and a visit to the show rooms of any of our large electrical firms will show the advances which have been made.

In addition to all these improvements the cost of lighting has been cut down by anything from 50 to 70 per cent by the introduction of the metal-filament lamp, and this reduction has naturally been followed by a great increase in the numbers of those who have had the elec-

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tric light installed in their premises. There are still many, however, who regard the price of wiring as prohibitive. They view with disfavor also the general upset which is inseparable from the visit of the wireman when wood casing or conduit is used. They are not always, as has been said, enthusiastic about electric light, if the installing means each room converted for the time being into a workshop, floor boards ripped up, carpets and hangings soiled by plaster and sawdust, and passages filled with lengths of casing and tubing, with a possibility of the premises having to be rewired at some future time.

To such as these one or other of the newer systems of wiring should appeal with direct force, and the contractor should certainly point out to them the advantages of the way of cleanliness, absence of cutting away and making good, and speed with which the work can be performed.—Electrical Manufacturer & Installation Engineer.

Electrical Education in 1915

The plea made by Mr. John A. Britton at the opening session of the National Electric Light Association in Seattle this week in which he mentioned California's supremacy in the development of electric power and transmission has really a far greater significance than may have been conceived, even by so brilliant a talker as he.

San Francisco is indeed a hub for the enormous potential activities of the Pacific Coast and it was to this city the first long-distance transmission system was developed. Every branch of electrical engineering practice may be observed and every step of the history of its development has been exemplified in the transmission systems connecting with the electrical supply of San Francisco.

The World's Fair in 1915 will far outshine in magnificence of display anything that has been heretofore conceived and it is all through the possibilities of

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the wonderful resources which have had their development in California. And the whole world has reason to expect such an exhibition, just as it might expect France to excel in silk textile exhibits, Persia in oriental tapestries, Germany in military organization, or Brazil in coffee and rubber. California can, however, go a step further, because while these various features of excelling are due more or less to local or sectional advantages, the development of the transmission and use of electricity is worldwide. Nevertheless California keeps always ahead, her engineers answer and fulfill the need without fear or favor. The world's greatest commercial science development will be found here in 1915.—Journal of Electricity, Power & Light.

Home Lighting.

The subject of lighting our homes gives us more thought than the furnishings. It is one of the greatest sources of pleasure or of distress. We find the designers and makers are fully aware of this and are studying our needs. Where electricity is to be used, it is a matter of perplexity to get the correct fixtures and the shades corresponding to the other furnishings that will produce a restful, satisfactory illumination. It is the same case where gas only is used. We are much interested in the indirect lighting. This method is where part of the light is sent to the ceiling and thence reflected downward, and the remainder of light is transmitted to the lower part of room. The result is a soft light through the entire space. This is ideal lighting for the dining-room or hall. It is not obtrusive as many of the central lights with shades, and now they have advanced so far in the making of the bowls that they really are works of art. There is one bowl which is made of composition resembling Carrara marble. It bears delicate classic designs which makes it ornamental when the light is off or on.

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By the Way

Some Industrial Information Worth the While

Dieckmann Company Moves

The Dieckmann Hardwood Company has moved its main office to the plant at Beach street, corner of Taylor, San Francisco. The change of location will enable the officers of the company to get in closer touch with the saw-mill operations which are increasing in volume right along. The Dieckmanns have always given a great deal of personal attention to details and this probably explains why the company has been so successful.

New Roofing and Magnesite Flooring Concern

W. H. Malott, formerly of Ford & Malott, has withdrawn from the company succeeding this firm, the Fibrestone & Roofing Co., and associated himself with E. H. Peterson under the firm name of Malott & Peterson, with offices in the Monadnock Building. The new firm will specialize on roofing contracts also the laying of magnesite flooring, for both of which lines they are eminently fitted by years of practical experience.

Contract Let for Municipal Car Barn

The contract for constructing a reinforced concrete building at the northwest corner of Geary street and Presidio avenue, San Francisco, to be used as a car house, office and substation for the Geary Street Municipal Railway, has been awarded by the Public Works Commissioners to F. Rolandi for $210,000. It is said the barn will be the most elaborate of any similar structure in the United States. A feature will be a fine gymnasium for the employes.

The Remedy For Damp Walls

A means of preventing the penetration of dampness and water through structures such as foundations, cellar walls and floors, tunnels, dams, reservoirs, swimming pools, and other concrete work, has often proved a difficult problem. Concrete is porous because of the

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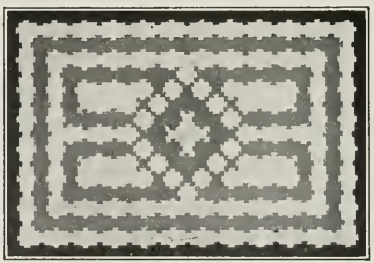

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voids between its contents. Under a glass a fresh surface of fracture shows that the pieces of stone and sand are smeared over with a very thin coating of cement wash with considerable remaining voids. Through these voids water will pass by gravitation and capillary attraction. To make the concrete waterproof, two principal methods have been tried. One is the filling of the mass throughout with a non-porous substance, or the treating of the surface so as to make it watertight. The objection to the surface coating is that it is easily broken or rubbed off in spots and is too weak to be serviceable as a waterproof coating should be. It is not satisfactory to waterproof the mass of concrete in such a way as to leave this important property at the mercy of continued watchfulness and renewals. A satisfactory waterproofing must be as durable as the concrete itself.

A waterproofing compound which is mixed with and becomes an integral part of the structure is known as Ceresit, a cream-white paste of about the consistency of butter. Ceresit paste is simply added to the water used in mixing the mortar or concrete and penetrates with the water to all parts of the concrete or mortar, assuring a permanent waterproof and dampproof structure. Among the properties of Ceresit may be mentioned

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that in addition to preventing penetration of any moisture whatever, it does not affect the original strength of the cement, and is so inexpensive as to make it a means of real economy. The many structures in which it has been used are continual evidence that it prevents the penetration of water, even under heavy pressure, as in dam, reservoir, bridge and similar work.

The Ceresit Waterproofing Co., Clark and Adams streets, Chicago, have published a pamphlet, sent free on request, illustrating many structures whose walls have been waterproofed in the manner described, and giving a list of local agencies.

Big Order for Roofing Tin.

Mr. J. A. Drummond, representative of N. & G. Taylor Co., Philadelphia, informs us that he has secured an order from the Forderer Cornice Works of San Francisco for 195 boxes of their leading brand Target and Arrow roofing tin, which is to be used for the roofing of the St. Ignatius church of San Francisco. The contract was let through the office of Mr. Chas. J. I. Devlin, who is the architect of the church. This is said to be the largest sheet metal contract ever let in San Francisco for ornamental sheet metal, cornice and tin roofing work combined. Mr. Drummond thinks this should be an argument for sheet metal and tin roofing as a fire retardant on buildings of this class as well as others.

More About the Subway Plans

County Surveyor Perry A. Haviland of Oakland has returned from an extended Eastern trip, and states he will soon be in a position to submit plans, maps and estimates as to the feasibility, cost and necessity of the proposed subway under the estuary, between Oakland and Alameda.

Haviland made a special study of the Eastern subways. He passed much time in New York, and says that he is convinced that the contemplated subway will immensely facilitate shipping on the estuary and traffic between Oakland and Alameda.

"While I was studying the work in the East I had the men in my office actively engaged in taking soundings and compiling data," explained Haviland yesterday. "We have taken into consideration the amount of traffic under the estuary and over it. We have also taken soundings and have made examinations of the geological conditions. I expect to be able to report within the next month or so."

The county appropriated $3,000 for the work of compiling data. Haviland made his Eastern trip at his own expense, and proposes to use his information in the construction of subways in other counties as well.

Forty Years of Service.

White Bros., the well-known San Francisco hardwood lumber dealers, have issued an attractive booklet entitled "Forty Years of Service." It is a short but interesting story of the firm's wonderful success. Here are a few facts taken from the book:

"The history of our firm begins with Peter and Asa L. White, who were born in the lumber section of "Down East," and entered the lumber business as a natural consequence of their environment. To fully appreciate the usefulness of various kinds of lumber, and learn their corresponding value, was a matter of course with them since their early boyhood.

"During the early sixties, when California was just in the infancy of its development, Peter White established a wholesale supply house in San Francisco, handling wagon material, hubs, spokes, etc., in conjunction with hardwood lumber.

"In the year 1872, the present firm of White Brothers was established by Peter and Asa L. White, both experienced in the lumber business. Under the careful management of these two pioneers the firm has prospered and gradually, as the business has progressed, has been so enlarged that now the house of White Brothers enjoys 'the' largest hardwood lumber business on the Pacific Coast.

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Artolith—What It Is

Architects are inquiring: "What is this Artolith we hear so much about lately?" In a word it is a perfect jointless flooring—waterproof, fireproof, sanitary and seamless. The Artolith Manufacturing Company has established a permanent studio at 149 Turk street, San Francisco.

Artolith is laid in a plastic state about the consistency of mortar; in the same manner as a cement floor, forming a continuous sheet without joints or cracks over the entire area to be covered. It hardens in from ten to twelve hours, and making a perfect bond with its foundation becomes a permanent floor.

Artolith can be laid on a foundation of concrete, brick, old or new wooden floors. Under ordinary conditions it is laid about half an inch thick, and when finished makes a fire-proof, jointless, non-slippery, foot-warm flooring, easily cleaned and sanitary to the highest degree. It can be laid in various colors, in panel or squares of different colors and handsome designs, lettering, etc., can be executed.

Artolith can be sawed or cut like hardwood and gives a firm hold for screws; it can be easily and cleanly cut or taken up and re-laid when neccessary to allow for pipe holes, traps, partition, etc.

Contractor Tells Why Oakland Firms Fail to Secure Work

In an address to the members of the manufacturers' committee of the Chamber of Commerce, Percy J. Walker, general contractor, explained why more of his sub-contracts were not given to Oakland men.

Walker stated that he had the figures bid by every contractor on every building erected under him in Oakland since the fire in 1906, and said that the trouble was that Oakland men lacked enterprise when it came to big contracts. This was proved, he said, by the fact that in buildings costing in the neighborhood of $100,0000, the proportion of contracts let to San Francisco and Oakland men was 144 to the latter and 53 to the former, whereas in class A structures, the proportion was 51 to San Francisco and 26 to Oakland. He cited the work on the Oakland Hotel and gave the figures on the various contracts, showing that if he had awarded the work to the Oakland men who had bid on it, the building would have cost exactly $172,000 more than its present cost.

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New Coast Manager for Pittsburg Water Heater Company

The Jos. Thieben Company, who have been successfully handling the Pittsburg water heater in Northern California for several years, announce an important change in the sales management of its heater department. Mr. C. A. Detweiler who has been connected with the Pittsburg Water Heater Company as Secretary and Eastern Sales Manager with headquarters in Pittsburg, Pa., has acquired an interest in the California business of the company and has commenced his duties as Sales Manager with offices and display rooms at 667 Mission street, San Francisco. Mr. Detweiler will devote his entire time to building up the Northern California business of the Pittsburg heater, giving close attention to the details and co-operating wherever possible with the architects.

The sales of the Pittsburg heater have now passed the one million per annum mark with the San Francisco office handling as many, if not more, than any other city in the United States. In view of the great demand for the Pittsburg heater on this Coast, the company feels justified in increasing its expenses out here by giving its customers the very best possible service.

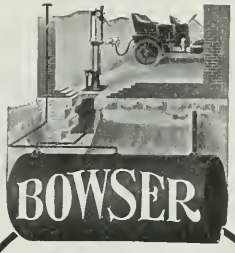
One of the most popular heaters on the market today is the Pittsburg "Bungalow" automatic, which is a gas water heater built especially for the small home. The materials entering into its construction are the best that can be secured—in fact, just as good as the materials to be found in the more expensive heater. It is so well built that it will endure under ordinary conditions for more than fifteen years and will pay for itself and earn a substantial dividend in the gas and time saved.

Frederick W. Muller.

In the recent death of Mr. Frederick W. Muller, of the firm of Klenck & Muller, the San Francisco General Contractors' Association has suffered the loss of a man whose membership will not be easily filled.

A large number of the stockholders and associate members attended the funeral, which was held on Sunday, June 2, in King Solomon's Temple.

Mr. Muller was a man of wide business experience, and one who had always made a success in the contracting business. At one time he was engaged in the brick manufacturing business at Antioch, and has been engaged in several other enterprises from time to time, but it was in the contracting business that Mr. Muller always made good money.



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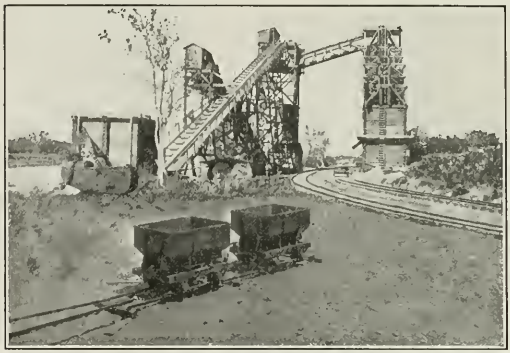

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New Plant of the Niles Sand, Gravel and Rock Company

THE enlargement of the uses of reinforced concrete construction and of plain concrete has so greatly increased the demand for sand and gravel that large modern handling plants are now greatly in demand. The use also of clean rock and thoroughly washed gravel and sand has become almost universal, as engineers have found that the washed materials give much better structural results than the dirty products.

At an enormous expense the most up-to-date washed rock and gravel plant in the United States has been built at Niles, California, by the Niles Sand, Gravel and Rock Co. The plant is situated on the bank of the Alameda creek which is said to have a bottomless depth of gravel. Some engineers have estimated it at from two to three thousand feet deep. The plant is reached by ample railroad facilities, including spur tracks of the Southern Pacific and right of way privileges with the Western Pacific Railway Company.

Mr. J. C. Buckbee, one of the most experienced engineers in this line of work in this country, and one who specializes in designing washed sand and gravel plants, was given *carte blanc* in designing the Niles outfit. Practically all the machinery was turned out in San Francisco by the Meese & Gottfried Company from Mr. Buckbee's plans. The cars were made by the Union Iron Works, while the motors—10 in number—and varying in size from 8 to 112 horse power, were furnished by the General Electric Co. The plant has a capacity of 125 cubic yards per hour, and is operated entirely by electric power furnished by the Pacific Gas & Electric Company. The plant equipment includes a Lidgerwood electric two-yard bucket excavator, which picks up two yards of gravel every forty seconds. The gravel is then hauled in cars by electric hoists to the main plant. Here it is dumped into a hopper, then fed onto a belt-conveyor 350 feet long, and carried to the top of the building where it is dropped into a box and thoroughly washed. It then passes through ten large cone shaped screens where it is again washed by a pressure of 1000 gallons of water per minute. All over size material is sent to crushers after leaving which it is again screened and washed

The company will regularly employ a force of at least twenty men. Work on the plant was commenced a year ago last April. It is now complete with the exception of the construction of several tunnels which will be used to carry by belt-conveyors the finished product to cars for shipment. Ample storage accommodations have been provided and special attention will be given orders requiring prompt shipment. The company is prepared to fill all orders within a radius of 200 miles of San Francisco. Offices have been taken in the Mutual Bank Building, 704 Market street, San Francisco, and orders by telephone or mail will receive immediate attention.

Somebody's to Blame

A haphazard manner of construction in the new San Francisco hall of justice and the need of $10,500 to put the building in satisfactory condition, non-fireproof construction in the new girls' high school and a deficit of $1,077,200 in the funds necessary to complete the San Francisco hospital are among the startling conditions found by the consulting board of architects in municipal buildings, according to their report submitted to Mayor Rolph. The architects are John Galen Howard, Frederick H. Meyer and John Reid, Jr.

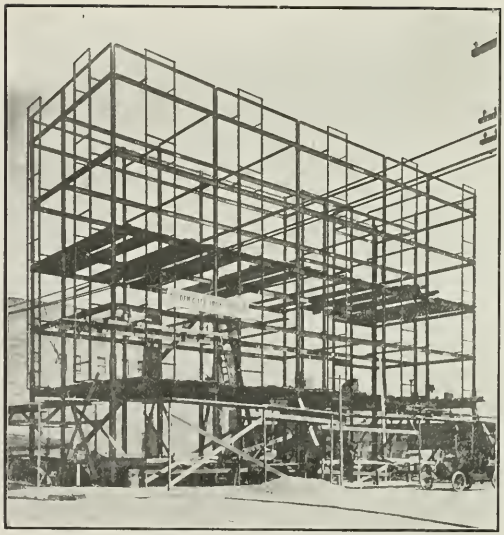
The report, which covers ten typewritten pages, reveals a mass of defective work in a number of buildings in course of construction, and sets forth the amount of money required to remedy the errors and omissions and to complete the structures.

Of the hall of justice and city and county jail the report says:

> Two other buildings which have been left in a more or less incomplete state are the hall of justice and the city and county jail. Although the contracts for the hall of justice have been completed and payments made, it will require $10,500 to put this building in satisfactory condition and settle unpaid bills. The interior finish of this building leaves much to be desired, and many things have been done in a haphazard manner.
>
> The city and county jail has been held up for lack of funds. We estimate that it will require $60,000 to finish this building. The building itself is left in an unsightly condition and does not receive the proper surveillance. Much material has been stolen and many windows broken.

The girls' high school presents a "forest of timber," says the report, and should a fire start "nothing could save it."

The architects also find that $12,000 is necessary to make the Polytechnic high school fireproof, and that the building was to be constructed with wooden floor joists and partitions similar to the girls' high school. They estimate the deficit at $81,310 72.



Steel Frame That Was Fabricated and Erected in Record Time

Record Time for Fabricating and Erecting a Steel Frame

The Golden Gate Structural and Ornamental Iron Works, is maintaining its reputation for rapid fabrication and erection of structural steel. The latest contract taken by this firm and completed to the satisfaction of the owner and architect was a five-story and basement steel frame for a building for Bannon and Melletz at the corner of Turk and Polk streets, San Francisco. As may be seen by the photograph, the steel cage is quite a pretentious one and represents a weight of more than 60 tons, covering a space of 27x83 feet and five stories in height. This frame was fabricated and erected in just 25 days. William Helbing was the contractor and D. C. Coleman the architect.

Mr. Marshall's New Position

Mr. Albert Jackson Marshall, who for the past seven years has been associated with the Holophane Company in the position of chief engineer, in charge of their Engineering Department, and subsequently manager of their Architectural Department, announces his affiliation with Mr. F. Laurent Godinez, Consulting Lighting Specialist to Public Utility Corporations. Mr. Godinez, who has had a thorough training in all phases of public utility work for several years, has been acting in an advisory capacity to a clientele composed of large combination gas and electric properties. Hereafter this work will be conducted under the name of F. Laurent Godinez and Albert Jackson Marshall, Consulting Lighting Specialists.

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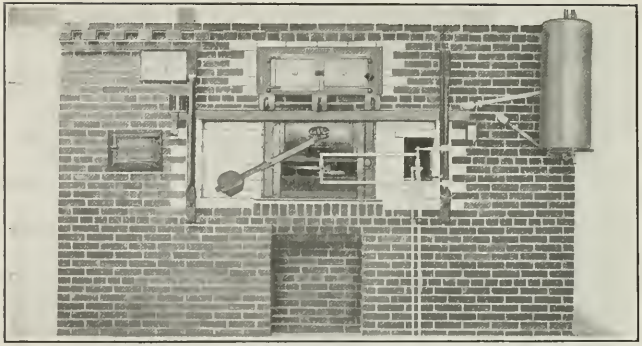

Baker's Oven in Johnson Bros.' Grocery Store, San Francisco

Oil Burners a Great Saving in Fuel Cost

The above cut shows a large size baker's oven which has recently been installed by the S. T. Johnson Company in the cake department of Johnson Bros.' grocery and bakery establishment at the southwest corner of Sacramento and Fillmore streets, San Francisco. It is said that the quality of cakes and confectionery turned out from this oven is not excelled by any one oven in the city.

This large inside firing oven is heated with an oil fire with one of the S. T. Johnson Company improved low pressure air oil burning systems. The oil burner is shown at the right hand side of the oven door, is attached to the buck stay (iron brace) of the oven and is made to swing in and out of firing position at the will of the baker. This is the most improved type of the old Dutch oven style and the oil fire is lighted at the main oven door and requires about one hour to heat the oven sufficiently to bake for the balance of a 24-hour day. The fire is so clean and the combustion is so complete that when the oven is heated (the inside is white and requires no cleaning out) there is absolutely no smell, smoke, soot or dirt of any kind.

The old way of heating these ovens was to lay sticks of cord wood on the hearth and inside the oven which would require three hours to burn out to give sufficient heat for an ordinary day's baking and after the fire had burned out there was left the coals and ashes to be cleaned out and the dirt from the ashes to be mopped out from the entire oven. This labor of cleaning the oven to say nothing of chopping the wood, would favor oil burning in an oven even were it not for the fact that burning the oil saves 70% fuel cost and provides a cleaner, quicker, handier and better way of firing. S. T. Johnson Company are pioneers in the oil burning industry and have perfected a low pressure air system for burning crude fuel oil which has been installed in the following places:

Odd Fellows Home, Santa Clara Co., both for the bakery department and for the heating equipment; the Larkspur Model Bakery, Larkspur, Cal.; J. G. Coomb's Planada Bakery, Planada, Cal.; Hotel Bon Air, Escalle, Cal.; Geo. Whittell's country residence, Woodside, Cal.; Old Piedmont Bakery, 1337 Grant avenue, San Francisco, Cal.; J. Crassia Bakery, 1624 Powell street, San Francisco, Cal.; E. Hitte, Apartment House, Washington and Mason streets; J. V. Tadich, Cold Day Restaurant, corner Clay and Leidesdorf streets; Cuneo Bros., 523 Green street; Butler Apartments Building, Gough and McAllister streets; Pure Food Bakery, 2010 Mission street; Eclair Bakery and Restaurant, 19th and Mission streets; Fefferman's Bakery, 541 Montgomery street; J. A. Coombs, 8th avenue and A street; Peterson Apartment House, Market and Noe streets; J. E. Harris Bakery, 21st avenue and Geary street; Weirich & Collins Bakery, 922 Valencia street.

An official of the company states that it is conducting a test in competition with other burners for the United States Government at Fort Winfield Scott Presidio, San Francisco, which test, it is claimed, has developed a saving of from 5 to 20% over other oil burners.

Something About Cabot's Damp-Proofing

THE problem of damp-course waterproofing—to provide for the direct application of plaster on brick and concrete surfaces without intervening furring and lath—has been made to appear complex and mysterious by the bewildering variety of products and grades, the numerous and wondrous titles that they bear, and the involved and semi-magical methods and processes of application. But when this intoxicating atmosphere is dispelled, it becomes a simple scientific problem, to be solved by a combination of properties that are permanently water-proof, insoluble, and adhesive, which will insure the user that moisture cannot penetrate, with a chemical inertness that will prevent deterioration with age. Such a product is Cabot's Damp-proofing, which accomplishes two things:

First—It forms a perfect and permanent bond between the concrete or brick wall to which it is applied, and the interior plaster which is applied over it.

Second—It forms a moisture-proof sheet or dam that prevents the penetration of dampness through to the plaster.

These two things are accomplished by making a compound which penetrates deeply into the pores of the concrete or brick wall, and yet leaves the surface in an adhesive, "tacky" condition, so that when the plaster is laid over it the damp-proofing is sucked deeply into its pores by the strong capillary attraction created by the drying out of the plaster.

This great penetrating power is produced by clarifying and refining the ingredients, so that all mineral impurities that prevent absorption are eliminated; and by scientific adjustment of the adhesive and water-proofing agents, so that they will always remain semi-plastic, or "tacky," and will not disintegrate or lose their holding or protective power. The mineral impurities so common in ordinary damp-proofings prevent penetration. This means that they have a weaker hold

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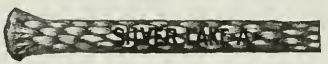

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on both wall and plaster; that they do not fill all the pores, and therefore give poor damp-proofing results; and that they deteriorate with age, owing to the disintegrating character of the impurities. Every ingredient of Cabot's Damp-proofing is in a fluid state, and it penetrates and completely fills the voids in bricks or concrete, and by capillary force is drawn into the pores and voids in the plaster. It is a scientific product, and neither haphazard nor mysterious.

Two Valuable Books

Two instructive and valuable books have just been published by the Norman W. Henley Company, 132 Nassau street, New York, and copies may be had at 50 cents each upon application to the publishers. One of the books is entitled: "Moulding Concrete Flower Pots, Boxes and Jardiniers," by A. A. Houghton. The molds for producing many original designs of flower pots, urns, flower boxes, jardiniers etc., are fully illustrated and explained, so the worker can easily construct and operate same. A new method of making plaster molds with the formulae for the compound, which has all the smoothness of a glue mold and is very durable thus enabling many casts to be made from the one mold, is fully described.

The other book is entitled "Molding Concrete Fountains and Lawn Ornaments," also by A. A. Houghton. The easily built molds for constructing a number of designs of concrete fountains that are fully illustrated and described in this treatise, enables the concrete worker to produce many beautiful effects in the most simple and easy manner.

The molding of a number of designs of lawn seats, curbing, hitching posts, pergolas, sun dials and other forms of ornamental concrete for the ornamentation of lawns and gardens, is fully illustrated and described. The successful molds for this work are easily made by every one at a very slight cost of time and labor.

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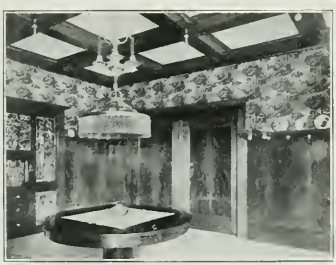

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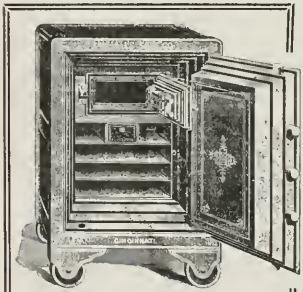

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A Hustling San Jose Business Man

AS indicating how business has grown in San Jose during the past five years, attention is called to the growth of the great paint and paper house of J. C. F. Stagg, 256-258 South First street. It is only six years since Mr. Stagg started in business in a very humble way, in a small roof 16 by 40, and with a stock of goods less than $450 in value. From that small beginning he has developed until today he has a store building in the business heart of the city, 45 by 110 feet in extent with a basement under the whole, and all filled with modern and new stock, which he is constantly adding to. At the present time, he carries stock valued at nearly $15,000, among which everything that can be wished for in the line of paints, paper, or house decorations can be found. Here are brushes in infinite varieties, house roofings of all makes, window shades of all sizes, picture mouldings, glass, dry paints, floor coverings and deadening felts, paper-hanger and glazers' tools, and, in short, every article along this line that can be found in a paper house anywhere, and it is a stock not excelled in the State, even in the larger cities. Mr. Stagg is a practical painter, and his advice in the selection of colors and the uses of paints is furnished free to his patrons.

Santa Cruz' Big Water Carnival

It begins to look as though every lover of fun and recreation would be present at Santa Cruz during the week of July 20th to 28th, when the greatest water pageant in the history of Western America will be promulgated under the direction of Mr. Fred Swanton and his associates. The ease with which residents in practically every section of the State can reach Santa Cruz; the attractive round-trip fares offered by the railroads; the moderate rates and splendid accommodations to be secured; and the variety of unique entertainment guaranteed by Manager Swanton, have proven irresistible magnets for hundreds of tired, overworked Californians, who long for a breath of the sea and a jolly vacation with care-free companions.

The re-opening of the Cottage City, where clean, comfortable accommodations may be had at a minimum of expense, has gone far to offset the unfortunate destruction of the Sea Beach Hotel, which burned last week. In addition, the new Hotel St George will aid the beautiful Casa del Rey in taking care of those who wish more elaborate quarters. The Casa del Rey and Cottage City will, in themselves, accommodate 1,000 guests while the hotel dining room and that of the big Casino will accommodate 1,300 persons at one time. President John Martin, of the Santa Cruz Beach Company, has notified Manager Swanton that there must be no extra charges made during Pageant week.

Several extra features have been added to the program during the past week. Aviators Bryant and Francis, famous throughout the West for their daring escapades in the air, will be on hand to lend a daily thrill to the festivities. Manager Swanton is now in communication with the Navy Department regarding the two submarines now in San Francisco bay with a view to having them at Santa Cruz for the pageant. It is understood that the Department favors this exhibition of the latest "water bull-dog." Thus it will be possible for visitors to see practically all of the modern forms of navigation—on the water, over the water and under the water.

The "Seafarer," America's entry in the Honolulu-to-San Francisco yacht race, has been invited to participate in the events of this "water week" and will probably be on hand with the winner's flag at her masthead. In addition, of course, will be the spectacular features arranged some days ago by Swanton—the yacht regattas, the motor-boat, shell, skiff, hydroplane and swimming races; the parade of decorated floats; the magnificent displays of fireworks; the bathing, golfing, dancing, driving, riding, fishing and kindred joys always associated with the Surf City.

Sidney Cavill, perhaps the most famous swimmer on the Pacific Coast and the first man who ever swam the Golden Gate, has been appointed as master of ceremonies for all aquatic sports, which means that they will be of a high order. Cavill, who is at present swimming instructor of the Olympic Club, is already in touch with some of the leading mermaids and mermen of the country many of whom have already signified their intention of participating in the water contests.

Succeeds Mr. Ward

Governor Johnson has appointed John Bakewell, Jr., of San Francisco, a member of the State Board of Architecture for the Northern District. The appointment fills the vacancy made by the expiration of the term of Charles R. Ward.

Exposition Notes

Word has been received by the Panama-Pacific International Officials that Costa Rica would participate in the 1915 Universal Exposition.

That country is the eighth foreign nation that has accepted President Taft's invitation to take part in the nation's celebration of the completion of the Panama Canal.

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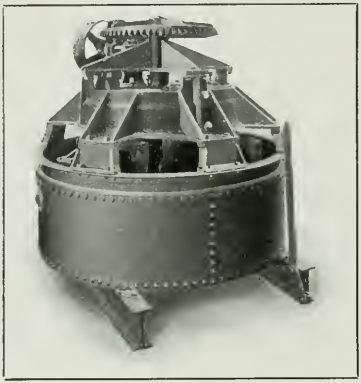

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The best authorities and investigators, both in this country and abroad, declare that rust is due to an electrolytic action set up between the Impurities and Iron.

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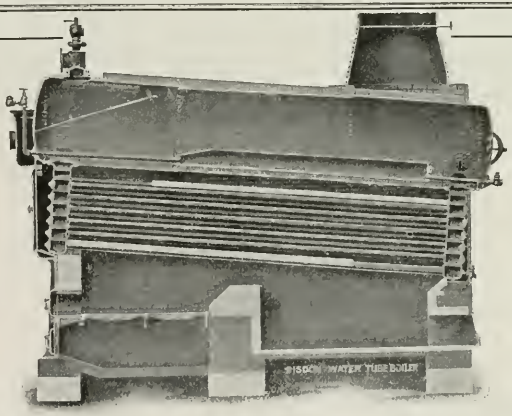

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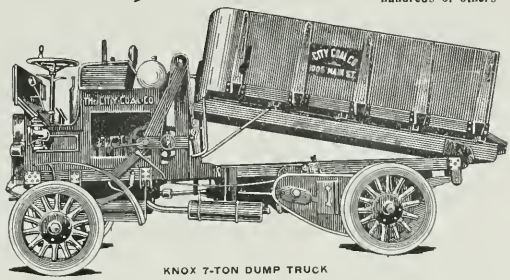

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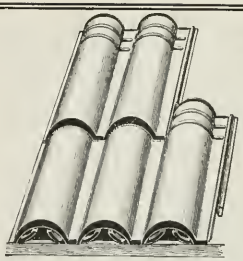

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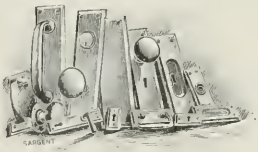

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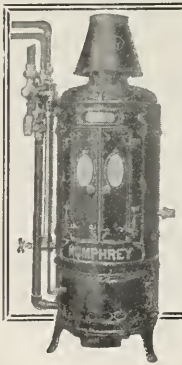

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Give soft, transparent coloring effects on cement, like the shingle-stains on wood, and are thoroughly and permanently waterproof. Cost less than paints or coatings, go farther and are more quickly applied. Cannot crack or peel.

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The illustration shows a Transom Bar Window having two sash equipped with Tabor strips and corrugated fixtures. This construction provides for the addition, perpendicularly, laterally, or both, of as many sash units as conditions demand. The joints between Tabor strips and sash do not leak.

We are makers of the Tabor strip and fixtures, for sliding-reversible, removable, vertically and horizontally pivoting and casement sash. Automatic casement adjusters. All metal weather strips. Automatic door bottom, and hardware specialties.

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READY FOR USE

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ADJUSTABLE HANGERS and PATENTED FRAMES

No extra thickness of wall required. Joins with a 4-inch stud.

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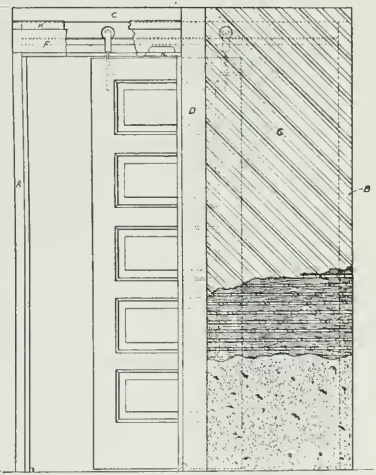

Fig 4

Ferroinclave The IDEAL CONSTRUCTION

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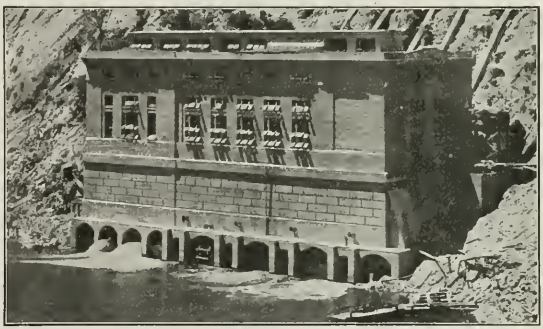

Ferroinclave roof and floors. Power House, Great Western Power Co., California

The BROWN HOISTING MACHINERY CO., Cleveland, O
San Francisco Office, 251 Monadnock Bldg.

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THE plaster gets in, through, behind and around the bead. It has been demonstrated time and again that the ***Hunt Bead*** can be wired to the lath in one-fifth the time required for other beads The fact that ***Hunt Beads*** are more perfectly installed in less time and at less expense than any other bead is a consideration not to be overlooked when making out the specifications. The force of a blow struck on a Hunt Metal Corner is immediately transmitted through the bead to the wall backing. With many other metal corners the force of the blow is carried through the plaster to the wall backing. This is a point vital to the architect or owner. As the bead sets flus against the corner it is very easy to place — no supports to adjust— no trouble at all.

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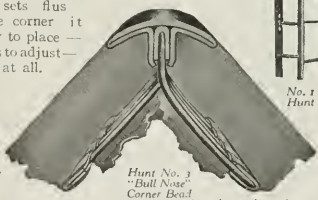

Hunt No. 3 "Bull Nose" Corner Bead
The size of this bead is $\frac{7}{8}$ inch wide and curved to a diameter of $1\frac{1}{8}$ inch

Hunt Metal Corner Co.

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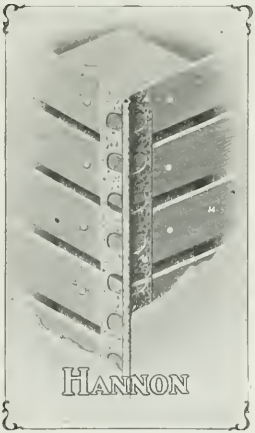

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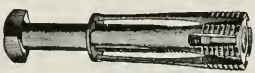

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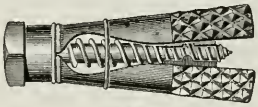

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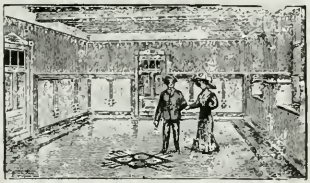

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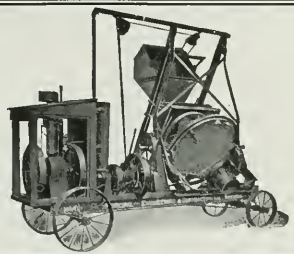

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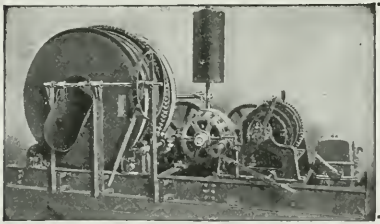

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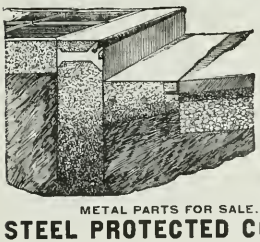

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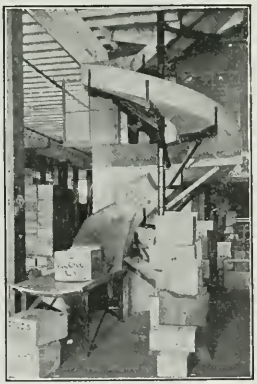

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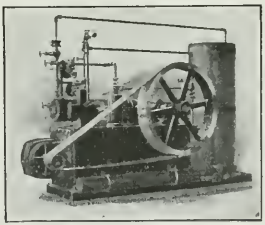

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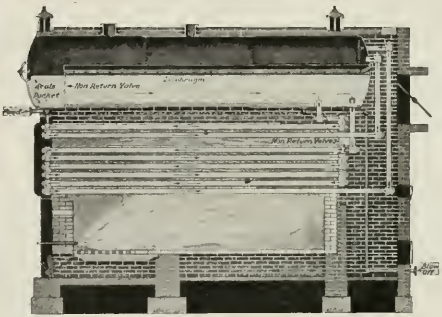
DAILY DEMONSTRATIONS AT 524 BROADWAY, OAKLAND



WITH many tubes in one header, the unequal expansion causes leaky joints. Rerolling thins the tube ends and means new tubes. In the design of a header holding but two tube ends each tube can expand without strain on header or joints. This is another feature of the

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